

BOARDWATCH MAGAZINE

ELECTRONIC BBS AND ON-LINE INFORMATION SERVICES

Editor: Jack Rickard Volume III: Issue 8 ISSN: 0894-5209 August 1989

THE BBS LIST

This month *Boardwatch Magazine* presents a list of 205 bulletin boards/on-line services available in area code 303. See page 20. Our national selection lists 106 systems from across the country we think you'll find useful beginning on page 18. Corrections may be addressed via the Denver PC Boardwatch Fidonet Echomail Conference, or by Fidonet Mail addressed to **JACK RICKARD** via Net 104 Node 555 at (303)973-4222.

TELEBITS

SOURCE INFORMATION NETWORK DIES AUGUST 1.

In a stunning announcement made during the final week of June, **Compuserve Information Service** announced its purchase of long-time competitor **THE SOURCE INFORMATION NETWORK** for an undisclosed sum. CIS announced flatly that they were purchasing the service and pulling the plug effective **August 1, 1989**.

The Source, once considered the Cadillac of online network services, had been struggling recently. From a high of 80,000 subscribers, the subscriber rolls had dropped to a recent low of 53,000 and nearly half the 115 man labor force had been cut to the current 70 employees all of whom will be dismissed when the service is closed down. Many felt the services \$10 monthly minimum service fee had kept the service from attracting more subscribers.

Compuserve, who until recently did not require any monthly maintenance fee, claims a half-million subscribers. This may be misleading as many individuals

open five or six accounts on Compuserve over the course of a few years due to free time offers and other promotions received with modem or software purchases from other vendors. Compuserve will not release the actual number of active subscribers. And they recently inaugurated a monthly \$1.50 maintenance fee which rumor holds has caused thousands of subscribers to drop the service.

The Source began operation in 1979 as the brainchild of William von Meister and Jack Taub. It underwent several changes of ownership including a \$10 million transit from Readers Digest of Pleasantville New York to New York venture capitalists Welsh, Carson, Anderson, and Stowe in 1987. The current loss of market share combined with some cash flow problems at Welsh Carson led to the current sale.

Compuserve has not announced which, if any, of the SOURCE services will be retained for use on the Compuserve Information Service. They effectively purchased little but the SOURCE subscriber list and judging by recent message traffic on the Source, that may not be as valuable to them as they thought. Apparently, many callers to CIS had felt a rather heavy hand of the CIS staff who rather freely edited and deleted messages posted on the service. THE SOURCE had a bit more of a hands off approach to special interest areas choosing not to censor/edit messages from callers. Compuserve currently has over 1000 employees and is owned by corporate behemoth H&R Block. Many SOURCE subscribers portrayed Compuserve as a heartless bungling corporate entity and few expressed an interest in "converting" to CIS.

Nonetheless, CIS will mail a free user id and password to all SOURCE subscribers and will include a \$20 usage credit. SOURCE subscribers who want to obtain their CIS user ID immediately can call (800)635-6225.

BILL SUSPENDS CONSTITUTIONAL RIGHTS FOR INFORMATION SERVICES

Representative George Gekas of Pennsylvania has introduced a rather interesting bill in the United States Congress. **House Bill 2082** would require bulletin board operators and information services to provide names and addresses of persons suspected of using communications networks to perpetrate crimes without requiring the formality of a search warrant. The bill could also compel telephone companies to provide the names and addresses of those calling the service - again without the requirement for a search warrant.

NATIONAL 3GBPS SUPERNET BILL UNDER CONSIDERATION

The United States Senate Commerce Committee began hearings in June on Tennessee Democrat Senator Albert Gore's *National High-Performance Computer Technology Act of 1989*. The bill calls for a \$1.75 billion investment over the next five years to erect a national information highway sporting a racey 3 Gbps (Gigabit per second) network. This net will be titled the National Research and Education Network (NREN) and should enable researchers to use supercomputers and databases spotted around the country without the delays normally involved in long distance computing. This would provide small companies, universities, and research labs access to supercomputer iron normally reserved for the larger and better heeled institutions. The net would be operated by the National

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"Exec-PC, the biggest, meanest, most off-dialed and audacious BBS this side of Silicon Gulch." *Milwaukee Magazine, June 1987*

"How important is the Exec-PC BBS? To borrow a line from a famous hamburger chain, I was the 1,282,770th caller served. And I do mean 'served'. Exec-PC is perhaps the premier BBS in the nation for exchanging software." *BYTE IBM Special Edition, Fall 1988*

"Exec-PC, the bulletin board answer to SuperStation WTBS, connects PC users continents apart." *PC World, July 1987*

"One of the best is Bob Mahoney's Exec-PC out of Shorewood, Wisconsin..." *PC Magazine, October 1988*

"They provide one of the largest, most extensive libraries of public domain software in the world." *Denver PC Boardwatch, December 1987*

"Exec-PC Network is by far the largest BBS we've ever seen. You say you want files? This board has them—whatever kind you want...In addition to having one of the largest selections of public domain software, this BBS is a good source for technical information and help." *PC Resource, October 1987*

WHAT YOU COULD HAVE

Would you like public domain and shareware word processor programs, communications programs, or excellent database management systems? How about personal money managers, or General Ledger programs? If that is not enough, look at the 3000 games and 15,000 free business oriented programs, utilities, tutorials, and reviews. This gives you everything from hard disk reorganization and backup to stock market management systems. We also maintain the *entire PC-SIG collection* online, the 1200+ diskette collection of public domain software from California.

WHO HAS IT?

Exec-PC owns and operates the nation's largest electronic Bulletin Board System. Through our BBS, our huge software collection is available to anyone who has access to a modem and a telephone line. We have more than 70,000 individual files available for immediate download to your computer 24 hours a day, every day.

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The BBS consists of a large computer with BIG disk drives (more than 3 gigabytes!) and many phone lines connected to it. The computer currently has 90 phone lines, allowing it to talk to 90 callers at once; it receives about 2000 calls per day. Using the BBS is easy, since it is menu driven and you simply choose what you want to do.

WE SURE HAVE FILES

A typical user will call the BBS, ask the BBS to show what files are new since his or her last call, find files of interest, then transmit those files across the phone line. After hanging up, the caller can examine and use the new software.

WE SURE DO TALK

Our BBS also has an active conference system where thousands of people share ideas and solutions. Some conferences include: PC General Topics, Communications, For Sale, Programming, Desktop Publishing, LAN, Graphics, Hardware Speedup, CAD/CAM, Private e-mail, etc. Why pay expensive consultants when there are hundreds of experts available in our forums and conferences?

HOW TO CALL THE EXEC-PC BBS

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2. Dial 414-964-5160.
3. The BBS will ask for your name, then you will be guided into the menus.

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You can call the BBS at any time without registering. You can tour the system, read messages, and download some of our files. For greater access privileges you may register at the following rates: \$20 for 3 months or \$60 for one year. There are no hourly or hidden fees! You may subscribe online with VISA or MC, or by credit card, check or money order with the form below.

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Signature _____ Expires ____/____

Name _____ Date _____

Address _____

City _____ State _____ Zip _____

Telephone (____) _____

Company (optional) _____

Name you will use for Logon to BBS (required)

First _____ Last _____

Password _____

BBS 414-964-5160

Science Foundation. The bill also calls for establishment of a national information database, artificial intelligence research programs, and a supercomputer development initiative.

80386SX UPGRADE FOR PC/XT MACHINES

Sota Technology Inc. of Sunnyvale California has made a real name for itself with a somewhat pricey but technically elegant upgrade board for old IBM compatible PC and XT machines. The Sota 286i is a half-card accelerator device containing an 80286 (AT class) microprocessor, some fast Random Access Memory (RAM), a socket for your old 8088 microprocessor, and a jumper cable that plugs into the old 8088 socket on your motherboard. The device speeds up old PCs and XTs to nearly AT performance for a street price of around \$400. The product has become pretty much replacement processor board of choice for breathing new life into old machines that seemed a lot faster three years ago than they do today.

Sota is scrambling to stay out ahead of the rest of the pretenders to this niche market and they've recently announced a new, improved, sweeter smelling, more powerful, longer lasting family econo-pack they term the Sota 386si. The new unit features Intel's 16-bit version of their popular 32-bit 80386 microprocessor. This oddity is termed the 80386SX chip and it is designed using the same school of thought that if you would put legs on a snake and cut off its tail you would have a kind of a cheap, slow, horse that ate rats. Though the chip is destined for failure as the heart of a production clone, it is actually quite ideal for Sota's use as an accelerator for an 8-bit machine. The choked down 16-bit path on this half-a-loaf 80386SX microprocessor is more than adequate for driving older 8-bit equipment. In some ways, it's actually overkill.

And apparently, the device is something of a screamer comparatively speaking. The combination of 16MHz clock speed and the on-board RAM cache memory will pump up your old PC class iron by a speed factor of about 18 - over twice as fast as the original IBM AT computer in fact. The unit makes the

trip from them to you for a somewhat immodest \$645 list. When the street price of these units comes down to the \$300-\$400 range, we think they'll move quite a few of them. Sota Technology, Inc., 559 Weddell Dr., Sunnyvale, CA 94089; (408) 745-1111.

LONG DISTANCE CARRIER IDENTIFICATION NUMBER?

Oddly, some telephone customers are not sure. Even more oddly, some customers are quite certain, but incorrect. Did the telephone company connect you to the long distance service you chose? There is a simple way to find out without the usual wait for the next operator, twenty questions-style games, and other silliness. To confirm you have the correct long distance company, simply dial 1(700)555-4143. A brief commercial message will thank you for selecting the long distance company you chose whether it is AT&T, MCI, or whatever. This is a good way to check if you've been "changed over" after selecting a new service.

GENIE ADDS ZMODEM FILE TRANSFER PROTOCOL

General Electric Information Service has added Chuck Forsberg's popular ZMODEM file transfer protocol to their GENie online information service.

GENie has become one of the fastest-growing online services in the world due to a combination of aggressive improvements and a low hourly rate. The basic 1200 bps access is available for as little as \$5 hourly during non-prime time night time hours. This combination has brought them to over 150,000 customers in just a few years.

ZModem was originally developed by Forsberg under contract to Telenet Corporation. The protocol was designed to alleviate the turn around problems XMODEM and YMODEM protocol users were experiencing with packet switch networks and satellite links. In the process, Forsberg created a protocol that featured extremely robust error correction and was effectively one of the fastest error correcting protocols available. It has become the darling of the

BBS crowd and GENie is the first commercial service to adopt ZModem as a file transfer option.

General Electric had introduced a Denver area regional service titled GEis on a 976 Scoopline number last September. The \$0.25 per minute price was apparently too proud for the Denver audience and the service closed during the first week of March 1989.

MACINTOSH CONNECTIVITY OPTIONS

On June 12, Apple Computer Corporation announced a host of approximately twenty communications products intended to shore up their image as a corporate desktop option. While Macintosh machines have developed a large following in corporate America within the past two years, the machine suffers from a dearth of avenues to connect with the existing computer world. The latest announcements were clearly designed to address that issue.

AppleTalk Phase 2 provides software and hardware connections to the popular IBM Token Ring Local Area Network (LAN) at transmission speeds of up to 4 Megabits-per-second (Mbps) and to the Ethernet-type LANs at up to 10 Mbps with up to 16 million AppleTalk nodes on a single LAN - eliminating the 255 node limitation. The TokenTalk and EtherTalk connections are accomplished via add-on circuit cards. The LocalTalk products using the existing AppleTalk connector on the back of the machine remains limited to 255 nodes at speeds of 230 Kilobits-per-second (Kbps).

The announcement also included products to link Macintosh to IBM mainframes, Digital Equipment Corporation hardware, and several communications "systems" including Open Systems Interconnection (OSI) and Transmission Control Protocol/Internet Protocol (TCP/IP). Most of these products will be available in the final two quarters of the year.

For mainframe connections, Apple provides the Apple Coax/Twinax Card with Macintosh Distributed Function Terminal software (MacDFT) at \$1495. This package allows multi-ses-

sion access to **IBM 3270** terminal networks in both coaxial networks and token-ring environments and should be among the first of the products available in the third quarter of 1989.

Henri Aebischer is Director for Network and Communications. In making the announcement, Mr. Aebischer indicated that Apple wanted to accomplish transparent connectivity to **DEC** and **IBM** product lines, **OSI** and **TCP/IP**. By doing so, he felt they would effectively cover 80% of the computer systems in use. Apple Computer, 20515 Mariani, Cupertino, CA 95014; (408)996-1010 or (800)538-9696.

AT&T OPENS DIRECT-DIAL LINK TO MOSCOW

American Telephone and Telegraph has announced direct-dial long distance service to Moscow effective this fall. This will be the first time direct-dial calls to homes and businesses in the USSR were possible. Initially, only Moscow will be included in the service with Leningrad and Kiev hopefully to follow soon. A call to the USSR will cost about \$6.57 for the first three minutes and about \$1.90 for each subsequent minute. This is about \$115 hourly.

KERMIT PROTOCOL GOES INTERNATIONAL

Just a few years ago, the concept of transmitting files between computers over telephone lines in any casual way was uncommon. And the transfer of files between different types of computers was unheard of. While Ward Christensen's **XMODEM** has become one of the most well known file transfer protocols between personal computers, another protocol has become more common in transferring files between mainframes and personal computers.

The mainframe to personal computer connection hosted some peculiar problems. Many communications controllers in use on mainframe systems at that time transmitted 7-bit data bytes exclusively. The personal computer world was entirely based on 8-bit bytes and the mainframe controllers simply ignored the 8th bit.

In 1981, Frank da Cruz and a small development team at Columbia University wrote a file transfer protocol that would bridge mainframe to microcomputer worlds and notably, convert 8-bit files into 7-bit data using the first 128 characters of the **ASCII** character set. The data could then be ported through the mainframe communications controllers. Essentially, any program or text file could be converted to **ASCII**, transmitted, and then reconverted on the other end. For want of a better term, they titled this error-checking file transfer protocol **KERMIT** after Jim Hensen's frog of Sesame Street fame. The protocol was placed into the public domain and has remained free for all to use up to the present time.

Mr. da Cruz is still involved with the project eight years later. He and the current distribution manager for Kermit at Columbia University, Christine Gianone, recently attended the First International Kermit Conference in Moscow. Kermit has always been essentially based on the American Standard Code for Information Interchange (**ASCII** code) which works quite well for English text files. However, many languages include non-roman characters. The Russian Cyrillic alphabet, as just one of many examples, uses an old slavic character set roughly patterned after Greek and invented during the ninth Century by a slavic apostle known as St. Cyril. In modified form, it is still in use in Russia today. Likewise, Japanese, Chinese, Korean, various Middle East nations, all use alphabets quite different from our own.

The authors of Kermit are currently adding an extension to the program to employ what is coming to be known as the International Transfer Syntax using the full 8-bit character set defined in the International Standards Organization (**ISO**) specification 8859. This specification accommodates various alphabets registered with **ISO** including Japanese, Hebrew, Greek, and Russian. **ISO** standard 2022 will be used to control switching between alphabets. Japan's Nippon Telephone and Telegraph, the Center for Atmospheric and Space Sciences at Utah State University, and the Harvard/Smithsonian Center for Astrophysics in Cambridge, Massachusetts have all

contributed to the draft and final design is scheduled for August 1989. Source code to be made available in February 1990.

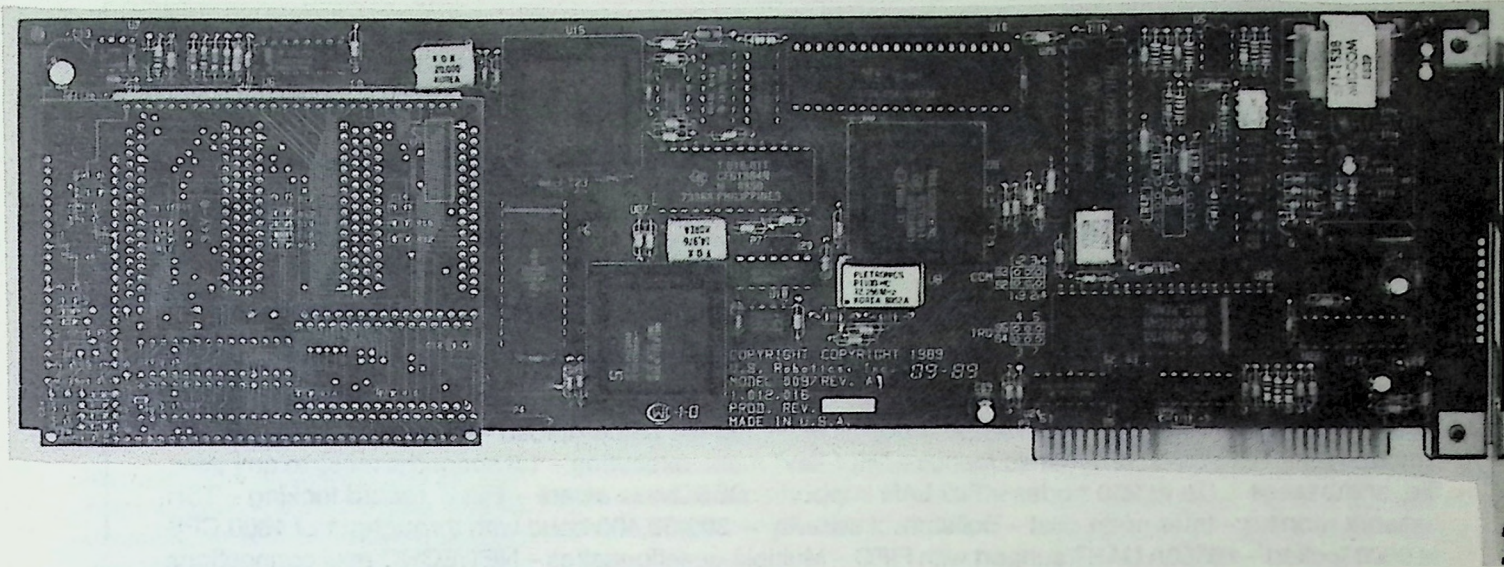
The new Kermit extension should allow transmittal of data files not only in other languages, but now also in other alphabets as well. The current version 2.31 of Kermit is available in a variety of formats for various machine platforms. The item for **IBM PC** computers is available for a \$20 charge from Columbia University Center for Computing Activities, 612 West 115th Street, New York, NY 10025; (212)280-3703.

TELETRIVIA

The United States leads the world with over 118 million installed and operating telephones. About 92% of US Homes have telephones according to a survey by consulting firm Frost & Sullivan. Japan claims 100% residential phone installation while roughly 28% of Soviet homes are telephone equipped.

British Telecom plc is widely credited in the industry with developing the first **MODulator DEModulator** or **MODEM** capable of transmitting digital data over analog telephone lines by converting the data to audio tones. The device spewed forth bits at the mind boggling rate of 110 bits-per-second (bps). Pretty racey for 1954.

Q-Link is an online service for Commodore computers operating out of Vienna Virginia. They've come up with an interesting paradigm for the online chat function. Callers can select cartoon characters and dress them with various articles of clothing and accessories. During a chat session, the characters of up to eight callers can appear on screen simultaneously. Dialog appears in cartoon "balloons" over the appropriate characters head greatly enhancing the socialization illusion of online chat networks. Q-Link. 8619 Westwood Center Drive, Suite 200, Vienna VA 22182; (800)545-6572.



US ROBOTICS ADDS THREE PC-INTERNAL MODELS TO COURIER LINE

U.S. Robotics, Inc. announced June 30 the immediate availability of new PC-internal versions of its high-speed Courier HST, Courier HST Dual Standard, and Courier V.32 modems.

The new Courier HST/PC modem, retail priced at \$895, features U.S. Robotics proprietary HST high-speed asymmetrical modulation, operating at speeds up to 14,400 bps and achieving effective throughput up to 26,000 bps with Microcom Networking Protocol (MNP) Class 5 data compression. It is compatible with all USR Courier HST external and rackmount modems at 14,400, 12,000, 9600, 7200, and 4800 bps. In its high-speed mode, the Courier HST/PC features a 450 bps reverse channel to provide full-duplex capability. This asymmetrical transmission technique is well suited to personal computer datacomm applications such as file transfer and interactive communication. The high-speed channel uses trellis coded modulation for superior performance on noisy lines.

USR's Courier V.32/PC model, priced at \$1349, is compatible at 9600 and 4800 bps with all CCITT V.32 modems. With MNP Class 5 data compression, the Courier V.32/PC modem can achieve throughput of 17,400 bps.

The new Courier HST Dual Standard/PC modem, priced at \$1395 combines all capabilities of the Courier HST and Courier V.32. It's the only available PC-internal, high-speed modem compatible with V.32 and vendor-proprietary modems.

All three modems fit any full-sized expansion slot in an IBM-PC, PC-XT, PC-AT, or any bus-compatible MS-DOS computer. All include MNP Class 1-5 error control and data compression for error-free throughput up to 80 percent faster than the modem's modulation rates. All are also compatible with CCITT V.22 bis modems at 2400 bps, CCITT V.22 and Bell 212A modems at 1200 bps, and CCITT V.21 and Bell 103 modems at 300 bps. The modems include a two-year warranty on parts and service.

With this introduction, US Robotics now offers the HST, the V.32, and the Dual Standard in internal, external, and rack-mounted configurations. US Robotics, 8100 North McCormick Blvd., Skokie, IL 60076; (800)342-5877 voice.

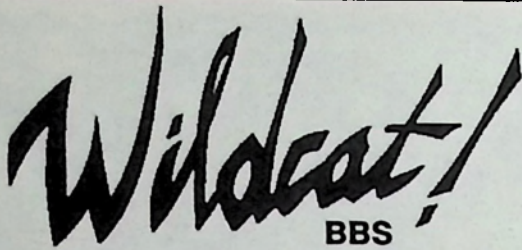
20 MB 3.5 INCH REMOVABLE FLOPPY DUE FROM QUADRAM

We've reported in several earlier issues about the Brier Technology disk drive that uses 3.5 inch floppy media to produce a formatted 20MB drive with removable media. Their intent was to market the drive to Original Equipment Manufacturers (OEM) at a price of

around \$400. Quadram of Norcross Georgia seems to be the first out of the gate with a deliverable product. They intend to begin shipments of the Quad-Flextra next month at a pretty substantial markup to something over \$800. The drive uses preformatted 3.5-inch diskettes that will be priced around \$25 - again, nearly triple the \$8 to \$11 that Brier had originally projected. Quad-Flextra will NOT be able to read/write ordinary 3.5-inch floppy diskettes and so the drive begins to look like a convenient backup technology alternative to the usual floppy disks, tape drives, and Omega Bernoulli drives. Quadram Limited Partnership, 1 Quad Way, Norcross, GA 30093; (800)548-3420

ISDN CARD FOR PC

Vadis Inc. of Richardson Texas has unveiled a line of add-on circuit cards for IBM PC/XT/AT or PS/2 computer owners allowing connection to Integrated Services Digital Network (ISDN) basic rate interface. The card offers five basic applications including voice call manager, data call manager, electronic mail system, desktop calendar, and a function to execute scripts based on who is calling using the incoming calling party identification feature of ISDN. The card works with the AT&T 5ESS switching circuitry and is priced at \$1180. It will not be available for at least 90 days. Vadis, Inc., Richardson Texas; (214)690-2481.



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FREE CD-ROM MAGAZINE

We found another infant publication struggling in a slightly different field titled **CD-ROM END USER MAGAZINE** edited by Linda Helgersen of Falls Church Virginia. Most notable is the magazines subscription price - **FREE**. You can obtain a sample copy by contacting them directly and activate your subscription by returning a form from the sample copy. DDRI, 6609 Rosecroft Place, Falls Church, VA 22043; (703)237-0682.

IBM AND AST ANNOUNCE 486 CARDS

IBM Corporation has announced a coprocessor card for their PS/2 Model 70-A21 computer titled the "Power Platform" employing Intel's i486 microprocessor. The new card should boost the Model 70 performance, already the top hitter in the IBM PS/2 lineup, by a whopping 300%. In addition to eye-popping performance, the card sports an impressive price of around \$3995. It should begin shipping fourth quarter 1989.

AST also announced a similar product for their Premier line of 80386 based machines. The Fastboard 486/25 features the same i486 microprocessor with 64K of fast cache memory on a 32-bit plug in circuit card. The card comes in two configurations with the upgrade for the Premier 386/33 priced at \$2995 and the upgrade from the Premier 386/25 going for \$3695. AST Research, 2121 Alton Ave., Irvine, CA 92714; (714)863-1333 (voice). AST also maintains a support BBS at (714)852-1872.

Advanced Logic Research is also rumored to have an i486 microprocessor booster card waiting in the wings for their 80286-based computers. The net effect of this flurry of 486 microprocessor cards is to raise the ante on desktop computing by a factor of at least three and possible four. This opens up the discussion of "what is possible" using microcomputers all over again.

Some skeptics note that the 486 microprocessor is not yet available in quantity and that by the time they are, a number of companies will have even more capable machines ready built around the 486 from the ground up.

Their performance would inevitably be greater than an 80386 machine with such a processor card.

CANON INVESTS \$100 MILLION IN NeXT

Steve Jobs has made a career of planning and building solid computer companies based on products all the industry sages thought inappropriate for any real markets. IBM and most computer professionals widely and loudly poooh-pooed the Apple computer as an inconsequential toy little more than a decade ago. This summer is the prime day in the sun for Apple Computer which is making dramatic if not traumatic inroads in corporate desktop environments with their immensely popular Macintosh product line and the company actually passed IBM in unit sales this year.

The top sport in the past two years has been bashing Jobs latest efforts with an odd black cube of Unix iron he terms NeXT. The unit runs nothing anyone else does, its odd looking, it uses the Unix operating system, and it is quite pricey at the educational institution deal of \$6995. The machine doesn't even

offer a floppy drive and Jobs originally said he would only offer it through universities.

Now Businessland plans on moving 15,000 units into businesses this year at an even loftier \$9995 each. And Canon has jumped into the breach to ply Jobs with a cool \$100 million for a scant 20% of the company and market it in the far east. This effectively values Jobs company, heretofore thought of as something of a crackpot effort, at \$600 million.

There is still a cottage industry in computer industry pundits sitting around dreaming up well thought out reasons why this system will never make it. We don't think Jobs was a flash in the pan with the Apple I, Apple II, Lisa (ok well maybe) or the Macintosh. He's one of the few individuals with a real vision for the future of desktop computers and one up-close look at NeXT shows a very hot, almost mystically attractive gadget. When all the cost/benefit analysis have been performed, all the bean counters have weighed in, and all of the productivity gain projections have been completed, the bottom line is that millions of computers are bought and sold each year because there is an army of thirtysomethingish male gadget freaks out there that have never quite gotten over their Captain Marvel Decoder Ring fascination. This machine caters to that, Jobs has the money to keep batteries in it until the world catches on, and we're desperately searching for a good Unix tutorial.

WIRELESS RADIO LAN

O'Neill Communications announce a wireless Local Area Network (LAN) that connects up to 20 local personal computers using radio transceivers that can link the machines at distances of up to 400 feet. The system provides relatively slow 9600 bps links and the number of systems that can be actively talking at any one time is limited. The company calls the network a Local Area Wireless Network (LAWN). The system uses four radio channels in the 902 to 928 MHz range allowing up to four LAWNs to operate in the same area. The units communicate via packets much after the fashion of the amateur packet radio networks. The required

hardware and software for each node in the LAWN is priced at \$495. O'Neill Communications, 100 Thanet Circle, Suite 202, Princeton, NJ 08540; (609)924-1095.

LOCAL ACCESS

LOCAL BREAKDOWN

This month's local list of online services sports a total of 205 entries. From time to time we like to take a look at some statistical data to see where we are in the world of electronic bulletin boards.

First, we would note that 80 of the 205 systems belong to the International Fidonet. This is significant in that 39% of all BBS in the area appear to belong to Fidonet. This is up 12% over the past year. We're not sure if this is because more systems are joining the net or if perhaps we are not doing as well as we once did in finding the non-net systems. We find these numbers of interest because Fidonet offers the largest body of electronic bulletin board systems for which accurate counts are available. This weeks nodelist lists approximately 4125 Fidonet systems. If the Denver figures hold across the nation, there are approximately 10,500 electronic bulletin board systems in operation now.

As modem prices fall, the community tends to migrate toward ever higher modem speeds. Practices and techniques unthinkable at 300 bps become commonplace at 9600 bps. The breakdown of highest modem speed supported by Denver systems appears to be as follows:

SPEED	QTY	SHARE
300 bps	5	2.44%
1200 bps	54	26.34%
2400 bps	111	54.15%
9600 bps	34	16.58%

The modem speed of choice is clearly 2400 bps with over half the systems online supporting that as the highest possible speed. The venerable 1200 bps modems, previously the standard means of transportation has fallen dramatical-

ly to just over a quarter of all systems while the 300 bps units have all but disappeared.

The 9600 bps is of course the current "high speed" standard and we note a jump over the last year from less than 5% to more than 15%. While the introduction of the V.32 in affordable models has been a plus, it has hardly become commonplace and 9600 bps connections still suffer from the problems of connectivity between brands. The lower speed 300, 1200, and 2400 bps units can all access each other across product lines essentially without problem. Of the 9600 bps units online, the following breakdown of brands seems to be extant.

MODEL	QTY	SHARE
Hayes	3	9%
Microcom	3	6%
Telebit	1	3%
US Robotics	27	81%

US Robotics obviously has the lion's share of this market although Hayes has apparently made some modest gains through their \$400 sysop special program. Of the 27 US Robotics modems in play, five feature the new V.32 chipset by Rockwell in their US Robotics HST Dual Standard configuration. Sysops typically pay roughly \$500 for a USR modem, \$400 if used, and between \$725 and \$750 for the new dual standard model.

SOLAR FLARE INFORMATION ONLINE

Religion aside, in a very real and practical sense, the center of our universe is the sun. It delivers the equivalent of some 100 trillion kW of power to the surface of planet earth which works out to about 1.35 kW per square meter. Via variably more or less direct extension, this power drives every activity, every motion, every element of our food chain beginning with the most basic photosynthesis, the hydrocarbons powering our machines, our weather, and our lives.

This somewhat ordinary star is 865,000 miles in diameter, roughly the mass of 330,000 earths, and consists largely of

hydrogen (72%), and helium (27%). A little over 600 million tons of hydrogen is consumed in the fusion process each second at the 27 million degree fahrenheit core of this monster. The surface temperature is more on the order of 10,000 degrees fahrenheit. But occasionally, magnetic currents will set up a charged area in the surface that cools somewhat beneath that. These are termed "sunspots". When two sunspots of opposite charge or polarity come into close proximity, the results can be explosive with billions of tons of matter heaved several hundred thousand miles into space at temperatures approaching 36 million degrees fahrenheit. This explosion is often termed a "solar flare". The resulting solar wind of particles, x-rays, and matter can disrupt radio, telephone, and television communications, cause the atmosphere to expand increasing drag on satellites originally placed outside the atmosphere, and affect satellite electronics oddly. As the firestorm of charged particles enters the earth's upper atmosphere, they are channeled toward the poles by the earth's magnetic field. This often creates a majestic aerial fireworks display known as the northern lights.

An apothecary and amateur astronomer in Germany named **Samuel Heinrich Schwabe** first noted the cyclic nature of sunspot activity and solar flares. He performed a series of solar observations over the course of seventeen years in an unsuccessful attempt to plot the transit of the nonexistent planet **Vulcan** across the face of the sun. Sunspots appear and move across the surface which was a major distraction to his search for **Vulcan**. But in 1843, Mr. Schwabe announced his conclusion that sunspots increased and decreased in activity on an eleven year cycle. Spots initially would appear about 35 degrees north and south of the solar equator. Spot activity would gradually migrate toward the equator until they disappeared at about 5 degrees latitude.

The last maximum in solar activity occurred in 1979 and the next maximum was projected for late 1990 or early 1991. But the eleven-year cycle is not graven in stone. It has varied in recent years from a low of seven years to a high

of perhaps sixteen or seventeen years. And it appears that this year it will be a bit early.

This past March, an area of sunspot activity appeared on the sun's surface large enough to hide about 75 planet earth's in. They shot a monstrous flare into the air that disrupted radio and telephone communications around the world. And the activity seems to be building - heralding an early, and perhaps intense period of solar activity.

It will be interesting to see just what effect the solar flare activity will have on personal computer data communications. The BBS/online information service game was not very well formed in 1979. Ward Christensen and Randy Seuss started what has come to be regarded as the very first personal computer bulletin board in 1978. And 300 bps modems were considered lightning fast in those days. Today, 9600 bps modems are becoming more common with very complex and somewhat delicate data encoding algorithms to squirt data through telephone lines. And those lines have been relatively quiet during the entire period when these technologies have been designed, developed, tested, and brought to market.

The US Department of Commerce National Oceanic and Atmospheric Administration in Boulder Colorado operates a Space Environment Laboratory (SEL) to monitor solar flare activity, geomagnetic fluctuations, and other activity that affects radio propagation. They operate a Space Environment Service Center Forecast and Advisory Bulletin Board at (303)497-5000 that provides very nearly real-time reports on solar flare activity. It is free. It is open to everyone. You may register or not as you like. And it undoubtedly serves as the preeminent online information source for solar flare/sunspot data.

The mission of SEL is traceable to activities of the US Government during the Second World War, when the Inter-service Radio Propagation Laboratory (IRPL) was formed in the National Bureau of Standards (NBS). At that time there was a strong requirement to support ionospherically propagated

communications to the European Theatre, which could be severely disrupted during times of solar and geomagnetic disturbances. In 1946, the Central Radio Propagation Laboratory (CRPL) was formed in NBS to place the work of IRPL on a permanent basis. In the early 1950's, CRPL moved to the new NBS facilities in Boulder. From these beginnings, the radio propagation work moved to the Environmental Science and Services Administration, and still later the space environment services and research activities moved to NOAA when it was established.

The modern era of providing space environment services dates from 1965, when SEL (then the Space Disturbances Laboratory) established a real-time forecast and warnings center. The needs for these services have grown and diversified, extending well beyond ionospheric communications to include such problems as radiation hazards to astronauts, increased drag on navigation satellites during magnetic disturbances, upsets of geostationary satellite electronics and other systems, induced currents in long lines, and the impact of geomagnetic activity on geophysical exploration by air-borne magnetometers.

The thrust of research activities within SEL is to increase man's understanding of solar activity and consequent disturbances at the earth, and to develop techniques for improving man's capabilities to monitor, forecast, and analyze solar-terrestrial disturbances. The forecasts, warnings, real-time data, and summary information are distributed via a variety of media, including commercial satellite broadcasts. The bulletin board is an effort to make the products available conveniently to a wider audience. We think it succeeds rather well. This system is not going to excite many online game enthusiasts. And if you are looking for the latest in shareware downloads, you may pass this one by rather abruptly. But it does cover everything else.....under the sun. National Oceanic and Atmospheric Administration, NOAA R/E/SE2, 325 Broadway, Boulder, CO 80303.

PRODIGY COMES TO DENVER

Computer manufacturer IBM Corporation and mammoth retailer Sears have teamed up to produce the most ambitious videotext offering ever with their Trintex **PRODIGY** service. After years of development and a total investment rumored to be in excess of \$700 million, the company began introducing the project last year and currently its available in about 18 metropolitan areas containing approximately 85 cities. Last month they added Denver and Miami to their list and the expressed intention of the company is to reach 45 major metropolitan areas by year's end.

The service introduces several notable developments in pricing, offerings, and presentation. The service is priced at a flat monthly rate of \$9.95 and you can use it as much or as little as you like. This places its business activities more in line with cable television companies than with previous videotext services. Prodigy operates its own network and so unlike Compuserve, The Source, and GENie, callers are not charged based on the amount of time they are on. Further, you may access Prodigy day or night at will. Most "clock" rate services have very high hourly rates during the day and more modest ones in the evening making online activity largely a nighttime sport. On Prodigy, there is no difference based on time of day.

The other element most noticeable about Prodigy is the presentation format. To access the service, in addition to an IBM computer, password/ID, and modem, you also must have some graphics capability and run the Prodigy proprietary terminal emulation software. This software uses a variant of the North American Presentation Language Protocol Syntax (NAPLPS) for graphics. Most online services are reduced to the lowest common denominator among personal computers - American Standard Code for Information Interchange (ASCII) allowing very crude text-only transmissions. Some IBM bulletin board systems use the slightly more adroit American National Standards Institute specification for terminal communications (ANSI) graphics to add blinking text, bold, underline, and color and a few BBS artiste's have emerged to paint

fairly attractive screens using ANSI graphics. But NAPLPS essentially offers a method for communicating what appear to be true bit-mapped 16-color graphics using a screen description language probably most analogous to the Postscript language popularly used to drive laser printers. The Prodigy terminal software allows them to use this language to communicate in pictures quite effectively.

We received a very professional package in the mail from Prodigy including two bone white diskettes, documentation in tiny diskette-sized spiral binders, and some plastic keyboard templates. One of the little booklets provided a list of telephone numbers you could use to access Prodigy. Unfortunately, none were included for Denver. We telephoned their customer service group at (800)759-8000, on a weekend, at night, and after the usual few minutes of listening to a machine talk to itself, we were connected with another humanoid. He provided us with numbers for Boulder (303)442-0571, and Fort Collins (303)493-0223 admonishing us that they were still under test.

Installation was quite easy. You simply place the diskette in drive A: and enter **INSTALL**. The software rather effectively and automatically surveys your equipment to determine graphics capability, hard drives, and modems. We were relieved to find that the service does allow use of 2400 bps modems. The program installed all necessary files on the hard disk and we activated the program by entering **PRODIGY**. The software asked us for the User ID and Password from our kit, and we were on. Interestingly, you can have up to five different people from your household with ID's and Passwords for the basic \$9.95 fee.

The service itself is a bit difficult to describe. After several years of reviewing online services we can usually sort out the wheat from the chaff with precious few slaps at the keyboard. Prodigy is not so simple and after several sessions a year ago in another city and four online sessions this month on the Denver rollout, we are still a bit uncertain as to what this service is and how to describe it.

WHAT IT IS NOT. The only thing Prodigy has in common with existing online services such as Compuserve, Dialog, GENie, etc., is that they all use modems. Nor is it in any sense comparable to an electronic bulletin board. And finally, it fails miserably as a news wire. Prodigy has no provisions for uploading, downloading, or storing files of any type. In fact, you cannot log a session to disk or printout screens, with a few very controlled exceptions, to the printer. Its E-Mail services are abysmal although you can send mail to other subscribers. Its Headline News is remarkably timely but a bit shy of exhaustive. We noted a story on the Supreme Court ruling on Missouri's abortion case on the afternoon of July 3rd. The ruling had been issued that morning so news is timely on Prodigy. But it is scattered helter skelter throughout the service and there is no way to just read a newspaper in any handy fashion. If you choose to compare it to commercial online services and electronic bulletin boards, you will likely be disappointed. A good multiline BBS with a file library and a chat function will likely be more valuable to you.

WHAT IT IS. Prodigy is, beyond all else, - pretty. We looked at it using an ordinary green screen Hercules compatible monographics system - nice. We also checked it out using an Orchid Prodesign VGA card with the new NEC Multisync 3D monitor. The presentation is simply stunning. It appears to be bit mapped graphics. The **KMART** logo looks just like the sign you see at the **KMART** store. Every screen on Prodigy has truly attractive and in some cases stunning art. You will often see keys on the left side of the screen next to menu options that look so real they have light highlights on the edges and actually seem to cast a shadow.

Navigation is really quite simple and intuitive if in some cases inconsistent. On screen buttons are available for going to the **NEXT** screen, **BACK**, to the **MENU**, or to **JUMP**. You can **JUMP** to anything in Prodigy where you know the appropriate jump keyword. The **TAB** and normal cursor keys allow you to move the highlight from one button to the next on screen and then of course the **ENTER** key selects it. Additional-

BOARDWATCH ONLINE INFORMATION SERVICE (303)973-4222

Boardwatch Magazine has earned a reputation for providing the most accurate list of electronic bulletin boards and on-line information services available in Colorado. By popular request, we are now offering an online service of our own, the Boardwatch Online Information Service

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The complete text of the current issue of Boardwatch Magazine is available for online viewing each month.

BACK ISSUES ARCHIVES/KEYWORD INDEX

The complete text of back issues of Boardwatch Magazine beginning with the January 1988 issue are available for on-line viewing. Additionally, a keyword searchable index to back issues is available online. Simply enter a searchword and the system displays the article title, issue, and page number along with an ID code. Find the article in your printed issue or enter the ID code to call up the actual text of that particular issue online. Finding earlier stories on particular topics or products is now a snap.

BBS LIST DIALING DIRECTORIES AND COMMUNICATION SOFTWARE

Pre-formatted dialing directories for communications shareware programs including Telix, ProComm Plus Test Drive, QModem SST, GT PowerComm, and Boyan. Simply download the dialing directory and place it in your terminal program subdirectory. The entire Boardwatch BBS list is available at the touch of a key. Dialing directories are updated each month. The Boardwatch Online Information Service will provide the latest versions of online communications software such as Telix, GT PowerComm, ProComm Plus Test Drive, QModem, and more. And finally, select BBS lists brought in from various cities around the nation. Find out what's happening with electronic bulletin boards right from the source - Boardwatch Magazine

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Gannett New Media's popular electronic online summary of the days events. Updated each weekday morning with 18 topical categories including News, Sports, Weather, Business Law, Banking, Real Estate, Insurance, Marketing and Trends, Technology, Telecommunications, Energy, Health, Personal Investing, and more.

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Award Winning weekly magazine monitoring the PC industry from reporting bureaus in San Francisco, Los Angeles, Atlanta, Toronto, London, Tokyo, Brussels, Sydney, and Washington D.C. The very latest in PC technology news. with categories for Apple, IBM, Unix, Business Applications, Telecommunications, Government and the Courts, Product Reviews, Boston Computer Exchange Closing Prices, and General Computer News.

INFOMAT MAGAZINE

Available on over 200 BBS nationwide, Alan Bechtold's Infomat Magazine is earning a reputation for timely, hard hitting news stories on PC technology and online communications. Includes Charles Bowen's Networkers Journal and columnist Dan Gutman.

TO ORDER:

Dial (303)973-6038 to charge your order to Master Card or Visa. Or, send personal check or money order to Boardwatch Magazine, 5970 South Vivian St., Littleton, CO 80127. Or dial the system at (303)973-4222 and select item 4. Boardwatch Magazine Information. Use the online subscription function to register online using Master Card or Visa.

Boardwatch Magazine	\$28
Online Information Service	\$35
Online Service and Printed Magazine	\$50

ly, pressing the first letter of any onscreen commands moves the highlight directly to it.

Each screen has an advertising panel at the bottom noting some product or another that you should ostensibly rush out and buy. A **LOOK** button allows you to get more details on anything that happens to catch your eye. And actually, you will likely find that a number of things will. Nearly a hundred companies are now advertising on Prodigy and frankly, some of them are interesting. Usually the promise of the little panel led to a disappointing advertisement underneath that really didn't tell you anything. Worse, when we tried to return to our previous screen, we instead got a master menu type of display and in some cases never did find our way back to the our original screen.

While we have seen the ad panels slammed in some other magazine reviews of Prodigy, we really did not find them intrusive. In fact, in just a few minutes, you will find you hardly notice them - although they do cut down the effective screen size. The commercial support is likely what allows the unique Prodigy price structure and we don't really fault it on that count. There is however, an element to this not only annoying but clearly, in our mind, dishonest. There are several items on the Prodigy menus, indexes, and jumpword lists that appear to be services when in fact they are nothing but ordering facilities for products. As an example, we find both *Consumer Reports* and *Weekly Reader* to be available online. We are big fans of *Consumer Reports* and *Weekly Reader* is undoubtedly the oldest and most respected childrens magazine in the world. Both are online in somewhat simplistic versions and appear on the menus, indexes, and so forth.

Likewise *Encyclopaedia Britannica* and the *Wall Street Journal* appear on menus, indexes, and jumpword lists. No element of either of these respected publications is on Prodigy in any form. When you got to those menu items, you are treated to a "special subscription offer" where you can order a subscription to WSJ or Britannica or sign up for more information. We urge Prodigy to immediately cease this dishonest and

misleading activity before they incur the wrath of our ever-ready-to-legislate government. A bit of screwing around here and we will all wind up with consumer interest and content regulations covering everybody with a telephone and a computer. Advertising is advertising and content is content. Don't try to blurr the line between the two by deliberately misleading the audience. This really is inexcusable.

We did play around a bit with another Dow Jones product besides the misleading Wall Street Journal ad. The Prodigy **QUICKQUOTES** service is essentially an extension of the popular Dow Jones News Service. You will pay a handsome hourly rate for this quote service on Dow Jones own system in the evening and an exorbitant one during the day. But the quotes are available on Prodigy and it is one of the best quote services we've tried. On most commercial services other than Dow Jones, it takes an interminable amount of time and effort just to determine what stock ticker code they use on **THAT** service to denote a particular company. No, they are not the same acronyms on all services believe it or not. We have a couple of stocks that are nearly impossible to find that we use to test such services. We have them because we once subscribed to the "*buy cheap at \$3 per share - hold until utterly worthless*" school of investment strategy. Our Alaskan Apollo Gold shares, purchased at about \$3 are now a solid 50 cent performer under the ticker symbol **APLOF** while the **R2000 Robotics** we paid \$3.50 for is no longer worth \$3.50 and they aren't into robotics. We think its down to owning an office building in New Jersey and the only stockholders left are Dad the President, Son the Vice President, Son's wife the secretary, and us at 5/16 bid 3/8 asked under the ticker symbol **RTWO**. On Prodigy, we found the trading prices of these two obscure equities in a matter of seconds. You can enter the ticker symbol or the company name on a very simple screen and it very quickly displays the object of your despair.

As a general note on speed, it is true Prodigy is a tad on the slow side. When you press a key, a little **WORKING** sign appears in the top corner of the screen until the data can be found and

transmitted to your machine. This may be three or four seconds or it may in some cases be 15 or 20. It is both annoying and irritating but we've experienced similar delays on other systems and at least on Prodigy, you're not called upon to pay for their foibles via a clocked charge. Oddly, it seemed worse on the monochrome system than on the VGA color machine. Consider 2400 bps a minimum connection and pray that 9600 bps operation becomes truly universal within the next year or so. It is not likely that Prodigy will read this review, say "Oh, we didn't realize that was a problem", throw a switch somewhere, and suddenly jump the speed up 400 or 500%. The slowness appears to be inherent in the very visual display provided.

What we have described is an online service that is slow, heavily commercial to the point of being deceptive, offers no file uploads or downloads, no chat areas, no simple functions to log your session to disk or printer, it forces you to use their terminal software, poor E-Mail, and current but scattered news. This all leads to the conclusion that Prodigy is not a good value. But we are enormously hesitant to put it in quite those terms. The service is hypnotically beautiful. And it is very large. There are hundreds of little alleys to rummage around in on this service. Navigation is easy, intuitive, quite natural after a few minutes. The business news was good, stock quotes, we did like the *Consumer Reports Magazine*. While nothing on Prodigy ever seems to amount to much once you open it up but it is easy to get around, pleasant enough, and in some ways quite a bit of fun. The advertising actually adds to the service in most cases and if the service has any clear cut use at all it is as a shopping service.

Prodigy really opens a new genre of online services. There may well be more going on here than just a poorly executed but pretty version of CompuServe. The commercial advertising/online shopping/NAPLPS graphics aspects of the service offer some interesting possibilities. This would be an easy service to dismember editorially and a number of PC computer columnists have done so with both style and substance. We've taken a couple of hip shots at it ourselves in the past and all

current criticisms may well be justly founded. But they also might be an easy out.

It can be as difficult to drive nails with a fish hook as it is to catch a bass with a claw hammer. By this I mean that if your only perspective in life is driving nails, a fish hook may appear at first glance a pretty damn useless device. And we understand they are none too popular among fish as well. But from a slightly different view, the fish hook has proven itself to be a remarkably efficient design for snagging fish by the upper lip, a task for which the claw hammer is somewhat less well suited. As a device for performing the operations most modem savvy PC owners are accustomed to, we don't think Prodigy is particularly attractive. File uploading, downloading, chat, and E-Mail comprise the usual list of suspects for online services. On the other hand, the current crop of online services are none too exciting to look at from a visual perspective and they've proven to be a notoriously poor way of trying to market something.

Further, it is about time we broke free of the chains imposed on online communication by the constraints of ASCII text. Higher speed modems should allow a higher bandwidth of communication. By mailing out several hundred thousand copies of their NAPLPS-based terminal software, not to mention introducing thousands of people to modems for the first time, Prodigy may proselytize the masses to online communication and hand us a graphics communication tool in the process. And the Prodigy terminal package need not be the final word. This protocol could conceivably be added to popular communications products such as ProComm and Telix as yet another terminal emulation and allow disk logging and screen printing in the process. The next step in this evolution would be a "Prodigy compatible" electronic bulletin board system. This graphics function opens a world of possibilities. The concept of cartoon-like characters on screen moving about, flicking cigarette ashes on each other, dancing, and interacting visually could certainly jazz up the popular world of chat on BBS. Menu design would never be the same. NAPLPS software on the Macintosh

and other machines could bridge the graphics/screen gap between IBM, Apple, NeXT, Commodore, and Atari pretty effectively. If nothing else, Prodigy may bequeath us a usable graphics standard for connecting personal computers.

The bottom line is that despite the fact that the service includes nothing that conventional videotext wisdom demands that it have, this service just might make history anyway. The corporate behemoth behind it seems committed to it and in fact, they opened an 80,000 square foot customer service center in New York this past month. Brian Ek, product manager claims there are 75,000 active users already making it the fastest growing videotext service in history. For \$9.95 per month, almost anyone with any interest in modems should take a couple of months of this service just to see what it is like. Prodigy Services Company, 445 Hamilton Ave., White Plains, NY 10601; (800)759-8000 voice (303)442-0571 data.

LONG DISTANCE USA

BOTANICAL RESEARCH BBS

It is no secret that we feel the main thrust of the future of information systems is in small systems specializing in a particular information field and gathering as much information as possible on that subject. Nowhere have we found a finer example of this type of online service than with a small system in Buffalo New York titled **TAXACOM**. The system operates at (716)896-7581 and offers absolutely the most amazing collection of information on botany in general and herbarium in particular that we could possibly hope for.

According to the system description, **TAXACOM** is directed at collections-oriented biosystematists and biogeographers. Richard H. Zander, Curator of Botany at the Clinton Herbarium of the Buffalo Museum of Science is the system operator while Patricia M. Eckel, Research Fellow of same acts as a Latin Translations Service and assistant system operator. Perhaps their vocation ex-

plains the particular depth and thoroughness evident in this online service. **TAXACOM** literally offers you more than you ever wanted to know about the botanical sciences. A series of herbarium databases with approximately 62,000 entries provides information on local orchids, local ferns, specimens available at the Clinton herbarium, field botanical types and much much more.

Mr. Zander publishes an online publication titled **FLORA ONLINE**. This is not only a fascinating publication in its own right concerning botany, but an interesting study in electronic publication. In fact, this group hosts a symposium called **INFORMATION MANAGEMENT IN SYSTEMATIC BOTANY** dealing with a number of questions on the future of computerized data management in collections-based research and archiving. They appear to be making a serious attempt at leading the field in putting the electronic tools underlying online systems and database management into play to augment scientific study. And they actively seek to electronically publish scientific papers of all disciplines.

The system uses some interesting software titled **FOR YOUR INFORMATION** offering some notably unique features including a very strong database function. And Mr. Zander puts the system through its paces. **FLORA ONLINE** is presented as a series of messages each of which act as a synopsis of an attached file available for download. You read the synopsis and then choose to either go ahead and download the file or not. The file is likely to be an electronic penata of text files, spreadsheets containing research data, or even software. One issue contained a seven part software program titled the Herbarium Manager. **FLORA ONLINE** was the first online scientific journal to receive an ISSN from the Library of Congress.

In the miscellaneous category, the operators offer an online Latin Translation service. We found a fascinating list of Natural Science BBS covering everything from Agriculture to Herpetology. And, we note a list of events, symposiums, and conferences, and another electronic publication titled **Clintonia**. The Volume 3, Issue 1, we

took a moment to look over offered a lengthy checklist of the flora of a limestone escarpment in Akron New York, a review of winter twig identification, a look at the flora of Cattaraugus County, a discussion of *Muhlenbergia glomerata* we just have to have a look at, and a list of books in the Niagara Frontier Botanical Society library.

We've become accustomed to extracting the gist of an online service with a minimum of pain over the last couple of years. We can get on and get off in an astonishingly short period of time with virtually all the "goods" on a service with pretty good accuracy. After thirty minutes on TAXACOM, we're convinced we haven't even struck this system a glancing blow. You could spend weeks rooting around in this service and still have an education left before you. We're not completely sure just what all is available on this system.

The service is free of charge, open to all, and in our opinion not only recommended but probably a national treasure. Richard H. Zander, Clinton Herbarium, Buffalo Museum of Science, 1020 Humboldt Parkway, Buffalo, NY 14211; (716)896-5200 voice.

MINNESOTA LIBRARY ONLINE CARD CATALOG.

I've been a sucker for libraries since age five and this disease has progressed every year since. Those of you tired of our never ending reviews of public library card catalogs get ready: I've got another one and it is good. The University of Minnesota has an online catalog for their Twin Cities Campus Libraries titled LUMINA. LUMINA is an acronym for Libraries of the University of Minnesota Integrated Network Access. Like our own local Colorado Association of Research Libraries, LUMINA provides online citations to literally millions of library holdings. This particular service offers 1,935,457 records when we called. While we're not sure what hardware and software is actually put into play here, it is effective. It features the fastest search algorithm we've seen online and a very attractive presentation as well.

The service is available at (612)626-2206. Note that it does require use of an unusual set of comm parameters with 7 data bits, even parity, 1 stop bit. This may appear on your comm software as 7E1 while most BBS/online services use the more familiar 8 data bits, no parity, and 1 stop bit (8N1). Note too, that use of this service specifically requires a DEC VT100 terminal emulation package. Both Telix and Procomm, for example, offer VT100/102 emulation and it must be specifically selected.

The additional effort at selecting VT100 emulation is amply rewarded. LUMINA has the prettiest display of any such system of this size and nature that we've seen. Dark blue text on a light blue background with white character highlights provide a stunningly readable display on a color system. Menu selections and commands are very clear and adequate online help text is available for most operations. The catalog can be searched by the usual Author, Title, Keyword criteria. And an additional search by SUBJECT function uses either standard Library of Congress subject categories or an optional medical database subject category.

We entered LYRE as a search keyword. After a pause of slightly over a second we were presented with a list of 81 citations. Simply pressing the M key took us to the next selection allowing a very welcome and natural browse capability. Entering GIN retrieved 38 entries. BOCCE brought us a single entry and that was in Italian. A voice help line is also available during normal business hours at (612)626-2272.

UFO INFORMATION SERVICE

Dale Goudie of Seattle Washington operates a moderately interesting PCBoard-based system titled Computer UFO Network or CUFON at (206)722-5738. The service provides some provocative data on the subject of Unidentified Flying Objects and their possible relationship to visitors from other planets. A massive list of some 71 bulletins offers text information on the history of UFO's during World War II, statistical chart by state for the period June/July 1947, lab results from a 1966 case attributed to swamp gas, a list of UFO Information Service addresses,

Associated Press articles on UFO's gathered over time, Freedom of Information Act Documents concerning UFO's, International Case Reports, and Soviet Astrobiological Research efforts. Overall, this is the most exhaustive collection of UFO lore we've found. The tone of the system is of course to debunk/rebut the work of those dedicated to debunking/rebutting UFO sightings. We did find one somewhat interesting report concerning a flying disk discovered by an Arizona rancher that was turned over to the US Air Force. The flew the disk via a "Flying Fortress" to some unknown destination for further study. Mr. Goudie may be reached by voice at (206)721-5035.

WRITERS HAPPY HOUR BBS

We found an interesting system up in Seattle Washington titled WRITERS HAPPY HOUR BBS at (206)364-2139. It's run by a gentleman named Walter Scott and interestingly enough it is about writers primarily. It runs on an IBM compatible unit using the PCBoard software and a Fastcomm BC Turbo 2496 modem at speeds up to 19,200 bps (if you have a Fastcomm modem).

Writer's Happy Hour BBS is fairly well focused on writers and those who wish to become writers. It hosts an echo message conference for Writers using the Relaynet software. Apparently, this is a take off on the Fidonet Echomail conferencing. The writer's conference seems to originate on this system and by the message traffic, it seems to have caught on around the country.

The system also has some file areas - again of interest primarily to writers. An assortment of style checkers, word processor file format converters, Word Perfect 5.0 utilities, Microsoft Word Style Sheets, and utilities for use with Ventura Publisher were in evidence. Apparently, they are planning a critique service to allow aspiring writers to upload material for review by others.

While on the system, we noted a diskette-based publication titled *READING FOR PLEASURE* we would like to take a closer look at. The system also has a conference for political commen-

tary, and another for recovering alcoholics and those addicted to narcotics. The system is colorful, and very well focused on its stated theme.

PUBLIC BRAND SOFTWARE BBS by David Hakala

The Indianapolis IBM PC User's Group has long distributed its library of shareware, public domain software and data files under the name Public Brand Software via diskette mail-order. Now PBS provides access to its 1-Gigabyte collection via BBS (317)856-2087. The system runs under PCBoard software using 4 incoming lines. It accommodates baud rates from 1200 to 9600 using US Robotics Courier HST modems. An 80386 machine acts as a file server, while each phone connection is handled by its own computer. This arrangement should provide maximum speed in a multi-line environment.

PBS promises "the most organized BBS anywhere." The titles are arranged in dozens of logical directories corresponding to the catalog disk-numbering system with which PBS mail-order customers are familiar. The detailed descriptions and 1-to-5-star ratings which make catalog shopping popular are also available on the BBS, a major improvement over the usual sketchy description available on most boards. The system even has a full-time "professional Sysop," Tony Moleta, who brings five years of experience to the party.

PBS has built a leading position in shareware distribution since 1970. It is especially noted among customers for the variety and currency of its wares. PBS gets new titles and updates directly from authors, and sponsors prize-winning author contests to solicit the latest releases. First place in the current contest wins \$100 worth of PBS disks, second place \$50 worth, in each of four categories: Utilities, Applications, Games/Entertainment /Education and Language, Math, Engineering and Commercial Systems Support (i.e., Lotus worksheets). Entries are restricted to original authors, and only to works written in 1988 or 1989.

The PBS BBS will include over 400 MB of software that is not in the print catalog, in addition to the 600 MB of mail-order titles. It also offers authors' and users' forums.

Some of the titles are truly rare, like the **National Geographic Index Database 1957-1987**. NG is probably the most-read publication in the universe. Someone once calculated that if all the copies of National Geographic ever printed were hauled out of people's attics, they would cover the planet to a uniform depth of four feet.

PBS is also one of the largest distributors of government agency data, at prices that thoroughly beat the U.S. Government Printing Office and the National Technical Information Service. The monthly **Business Conditions Digest**, for example, costs \$240 per year from the government, \$100 from PBS. The **1988 Census City/County Data Book** is available from the Census Bureau for \$360 on 27 disks, or from PBS for just \$50 on 12 archived disks. Such disks include utilities for translating raw data files in database and spreadsheet readable formats, and other programs for selecting data from each set.

Private sector data disks are also available, such as the **Motorola Database of Discrete Device Products**. This hacker's wish list includes over 7,000 parts and components and 20,000 cross-references. The software allows one to easily find 15 types of Zener voltage regulator with a 5.1-volt nominal rating, 1-watt minimum, and a 5% voltage tolerance. Essential information for someone, I'm sure. Other esoteric items serve the needs of civil and electrical engineers, HVAC contractors, wastewater and environmental hazard consultants, educators, doctors and many other professions.

The PBS BBS is offering a special subscription rate until August 1. One hour per day access and download privileges until July 31, 1990 for \$35. After August 1, 1989, subscriptions will cost \$50 per year. Public Brand Software: P. O. Box 51315, Indianapolis IN 46251. Voice:(800)426-DISK(3475). Modem:(317)856-2087.

WHAT PRICE JUSTICE ? STATUTES ON TAPE

by David Hakala

"Ignorance of the law is no excuse," according to some medieval judge who obviously never envisioned the morass of legislation in which we live today. The United States Code of statutes is twice the size of the Unabridged Oxford English Dictionary. The Code of Federal Regulations issued by agencies created by the U. S. Code is even bigger, more bewildering and contradictory, and grows every day. Each state and municipality adds its own formidable body of commandments to the ever-increasing burden of petty legal knowledge imposed on us. Did you know you can go to jail in Baltimore for walking backwards on a public sidewalk with an ice cream cone in your pocket? And North Carolina levies a \$200 fine on anyone participating in a dwarf toss.

Information technology facilitates comprehension of all these laws and regulations (though not, alas, their curtailment). The U. S. Code and C. F. R.'s are now available on 9-track tape. Many federal agencies are converting their directives, memos, and other profundities to magnetic media. Slowly but surely, the states are following suit. Most major municipalities will inevitably join the electronic age too.

But is all this effort being expended for the benefit of the governed or the governors? My recent research of government information resources raises some disturbing questions about keepers of the public trust. Many seem to think the law is their personal property, to be doled out to the people on a need-to-know basis. A few advocate outrageous profiteering in ways that would land private infopreneurs before a grand jury, all in the name of "revenue enhancement."

OSHA (Occupational Safety & Health Administration) maintains a 2-Gigabyte online information service, which is supposed to be accessible to the public at local OSHA offices. Calls to the Denver branch inquiring about this service were grudgingly answered by some incredibly ignorant

bureaucroids. Four of these uncivil servants professed utter ignorance - globally and without restriction to the specifics of our inquiry. The fifth ungraciously gave me the Salt Lake City voice number of the **OSHA Computerized Information Service (801)524-5366**.

The OCIS database is managed by Marty Childress, who has a much better attitude toward his work than the local crowd. Childress presides over a wealth of public information: the full text of OSHA regulations, directives, memos, even transcripts of public hearings. OCIS contains the definitive field sampling data on every conceivable occupational hazard, cross-indexed by geographic and SIC codes. It also includes vital data on analytical methods, hazardous chemical and industry safety standards, training materials, even a directory of expert witnesses. Anyone concerned with on-the-job health and safety must lust for electronic access to this information.

Childress expressed keen interest in making all this data available on compact disc, with special concern for keeping the market price of such products affordable. But he went on to lament the pervasive lack of concern for the consumer's pocketbook on the part of many others in the federal bureaucracy.

According to Childress, agency managers participating in SIG-CAT (Special Interest Group for CD-ROM Applications & Technologies) deem end-user cost "irrelevant," much to the delight of the commercial vendors who collude with the data-keepers at monthly meetings held near Langley Virginia. There is a public-access SIG-CAT BBS at (703)648-4168.

Apparently, many custodians of public information feel they are entitled to charge whatever the market will bear, regardless of how it affects public access. A survey conducted by the Colorado Office of Legislative Legal Services reveals a wide range of prices for statutes on tape from a low of \$5 for Florida's statutes to a high of \$175,000 for New York's laws which must be inherently more valuable than Florida's. By comparison, the U. S. Code is avail-

able from the GPO on 55 9-track tapes, at a total cost of \$6,875.00 (\$125 per Code Title).

Colorado's OLLS did not conduct this survey out of idle curiosity. It will be holding public hearings, probably in August, on the subjects of how to provide electronic access to state statutes, who should have such access, and who will profit by how much.

Charlie Pike of the OLLS indicated that current sentiment among the parties to this price-fixing conspiracy is running in favor of \$5000 to \$10,000 for the magnetic edition. Pike unabashedly admits the legislative community's objective is to raise additional revenue from the sale of public laws on tape. This is an outrage; we've the people have already paid dearly for the writing and administration of these statutes! Any government charges in excess of the bare-bones cost of reproduction amounts to double taxation. Government should not be permitted to engage in an enterprise for which it is singularly unqualified: the efficient dissemination of straight answers. It certainly should not be allowed to egregiously profit (not once but twice) from a captive market.

Colorado citizens who want to make their wishes known on this issue may call the OLLS and request to be notified when the hearing is scheduled (303)866-2045. The print edition of Colorado's Revised Statutes is presently published by Bradford Publishing of Denver. The price of the complete set is \$516.14, including 7.2% sales tax. (Interesting; we must pay taxes for a copy of the laws we must obey!)

EDITOR'S NOTES

Colorado enjoys some inherent advantages in the telecommunications field. Its central geographical location makes it ideal as a physical gateway for satellite communications. The labor force is largely technically adroit and a thriving high technology industry already exists with large players such as Martin Marietta, IBM Corporation, Ball Aerospace, Cray Computer, Hewlett

Packard, Storage Technology, Miniscribe, and Honeywell as well as literally hundreds of smaller startups, computer software firms, etc. American Telephone and Telegraph and US West both have major facilities here. Though not widely publicized, Denver is becoming a power center for the cable television industry with TCI controlling nearly 20% of the cable television connections in the world. There are more federal government offices in the Denver area than any other city in the world with the lone exception of Washington, DC. Pueblo recently landed 600 jobs in a telephone customer service center locating there. As we go into the future, telecommunications will likely gain an ever greater role in our national economy and Colorado may well find itself in the enviable position of being at a natural crossroads for such activity.

With geography, technology, and economics moving so strongly in that direction, you might assume that our educational system is at the vanguard leading Colorado bravely into a bright economic future based on this emerging data communications technology. Sadly this is not the case. Rather, we seem to have birthed a billion dollar per year industry in educational administration, bureaucracy, and inertia. Already sporting some of the most highly paid educators in the nation, our educational system seems to have its sails trimmed for one essential goal at the cost of any and all others - higher pay for teachers and most especially, higher pay for the ever growing ranks of insouciant, posturing, mid-level administrative functionaries drawn like moths to this eternal flame of public largess.

With the exception of a handful of educational pioneers among the lower ranks who struggle for enough funding to run a few bulletin boards on aging Apple computers under the suspicious eyes of the admin types, data communications has enjoyed a very peaceful nonexistence in our educational system. Colorado is manned by fairly young, educated, technical professionals who want a good, current, relevant education for their children and are willing to pay for it. There are some indications that they may not be getting it.

State Senator Sandy Hume of Boulder Colorado introduced **Senate Bill 165** early this year to try to build a little fire under the bulging flanks of this system. The bill specifically notes a lack of coordination between various state agencies regarding telecommunications facilities and services particularly among the various departments involved with education from Kindergarten to 12th grade as well as at the university level. The bill passed overwhelmingly and establishes a **Telecommunications Advisory Commission** chartered with rendering recommendations to the General Assembly by **December 15, 1989** on how to at least yank Colorado into the present if not the future regarding use of telecommunications in the state - particularly as it pertains to education.

The commission met in June and a consensus is already forming among members that may well prove revolutionary. Dr. Ed Lyell, member of the State Board of Education and a strong proponent of data communications technology is leading the charge toward a vision of a **Tele-Communicated, Connected, Technology Rich Learning Network for all Colorado citizens**. The commission has decided to survey high technology businesses, telecommunications firms, representatives of the cable, audiotext, and videotext industries, existing educational departments, and other interested parties to design, develop, and implement a multi-media information network for the use of all Colorado citizens for the purposes of information literacy.

We applaud this effort and urge this commission to bring this concept to its maximum possible potential. We would urge the commission to look just a bit past what is possible with currently available funds and what might be feasible politically. Computer industry vendors to a man have been utterly perplexed and frustrated by the bureaucratic foot shuffling and nose picking from educators across the nation. IBM, Apple, and of course Steve Jobs NeXT Incorporated, have literally tried to give equipment, software, training, etc. to educational systems wherever they could find anyone to talk to that could spell computer and with few exceptions to no avail. These ven-

dors have an overpowering vested interest just in placing their keyboards before the students of today in an effort to become the computer of choice for tomorrow's business leaders. But despite extremely generous grant programs (IBM Corporation announced a **\$25 million** educational grant program this past month), student discounts, and more, there really has been no way to effectively conduct such activities.

We would advocate the commission recommend to the General Assembly a fairly shocking but exciting program to implement a statewide **Colorado Educational Data Communications Test Bed** with the express and unwavering goal of becoming a national model for the development of technologies in education. Vendors could then be invited to develop and test educational products for connection to and use on this "Test Bed Network".

We think this type of bold move would draw support from and serve as a focal point for private vendor efforts to develop and market products to the educational community. If successful, this system could serve as a national model, providing information to and drawing suggestions and criticism from educators at the national level and hopefully, support and interest from our federal efforts in education. Note that Senator Albert Gore is up before the United States Senate for the second time now calling for a nationwide **3 Gbps** backbone system to link up educational systems and private industry across the land. We can be there early and well with just a bit of forethought and leadership.

While we do advocate instructing tomorrow's leaders in the basics of telecommunications, online information research, and computer technology, we would further encourage the use of such technologies to teach fundamental and traditional subjects such as History, English, Composition, Mathematics, Sciences, and so forth. There are many students in the rural and remote areas of Colorado who are currently threatened with a "second class" education due entirely to their physical distance from the main Denver/Colorado Springs corridor. Traditional costs of remedying

this grow more fearsome each year. But by bringing these students into our mainstream system via an online connection, we can seek to address this issue via technology.

Clearly it would be nice if the educational leadership in Colorado would present to the legislature an ambitious and inspired program to implement today's technology to completely overhaul our educational system making it more effective at preparing our children for tomorrow. It would be nice if they brought the same technology-driven productivity gains to reduce costs in education that private industry has so profitably employed during the past few years to bring down costs in the business sector. But they are not going to do it, they have no interest in doing it, and it is singularly open to question whether they have the technological wherewithal to do it if they did want to do it.

Senator Sandy Hume read that quite rightly and we applaud his leadership in taking the bull by the horns to drive this possibly traumatic but necessary change from the very top level of state government rather than awaiting some religious conversion from within the educational system itself. Dr. Lyell and the Telecommunications Advisory Commission seem to be heading toward an exciting vision of what online education can be in the State of Colorado and we both applaud their efforts thus far and encourage them to move boldly and dramatically in all future deliberations. They have an opportunity to guide a generation toward educational excellence. We urge each individual with an interest in data communications, and any business or corporation with a vested interest in Colorado, its educational system, and its future labor force to provide immediate and thoughtful input to this commission. We call on grass roots educators from all Colorado school districts who have any innovative ideas or programs they would like to see implemented or who have been thwarted from innovating in telecommunications by bureaucratic thumb sucking to contact this committee directly with their ideas. Contact Dr. Ed Lyell, 2187 Sunridge Circle, Broomfield, CO 80020; (303)466-6707.

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BOARDWATCH MAGAZINE

NATIONAL LIST OF ELECTRONIC BULLETIN BOARD SYSTEMS AND ON-LINE INFORMATION SERVICES - AUGUST 1989

SERVICE	PHONE	DESCRIPTION	SPONSOR/SYSOP	LOCATION
ADA Information Clearinghouse	(202)694-0215	Information on ADA Programming Language/Military Specs	Department of Defense	Washington, D.C.
Ashton-Tate Technical Support	(213)538-6196	dBase and Multimate Software Support System.	Ashton-Tate Corporation	Torrance, CA
AST Technical Services BBS	(714)852-1872	Superb support system for AST Computer Products	AST Research Inc.	Irvine, CA
AT&T Support BBS	(201)769-6397	Support for PC 6300 and Other AT&T PC Models	American Telephone/Telegraph PC Division	Plainfield, NJ
BBS Press Service	(913)478-9239	Home of INFOMAT Online Weekly PC News Magazine	Alan Bechtold/BBS Press Service	Topeka, KS
Big Peach BBS	(404)446-6650	Home of Automenu and Treeview Software	Marshall Magee/Magee Enterprises	Norcross, GA
Big Sky Telegraph	(406)683-7680	Educational Plans/Services to Rural Montana Schools	Montanna Rural Education Network	Dillon, MT
Boston Clnet	(617)439-5699	City of Boston Information Service - Advertising Supported	Advanced Videotext Systems	Boston, MA
Brown Bag Software BBS	(408)371-7654	Power Menu/ PC Outline Software Support	Brown Bag Software	Campbell, CA
ButtonWare BBS	(206)454-2629	PC-File dB / PC-Calc / PC-Type Software Support	Jim Button/ButtonWare	Bellevue, WA
C.A.R.L. Library Service	(303)830-1165	Citations to 2 Million Texts in Colorado Library System FREE	Colorado Alliance of Research Libraries	Denver, CO
Canada Remote Systems	(416)232-0442	Probably Canada's largest BBS/Online Information Service	Jud Newell	Toronto, Ontario
Cathouse BBS 205/2901	(805)395-0650	Multiline Support System for Wildcat BBS Software	Mustang Software	Bakersfield, CA
Census Bureau Office Automation	(301)763-4576	Microcomputers and Office Automation	US Dept. of Commerce/Nevis Frankel	Suitland, MD
Census Bureau Personnel Division	(301)763-4574	Employment Opportunities Within the Census Bureau	US Dept. of Commerce/Nevis Frankel	Suitland, MD
Channel 1	(617)354-5776	Twenty-line New England PCBoard System	Brian Miller/Tess Heder	Cambridge, MA
Classi Computer Fieds	(317)359-5199	Online System for Classified Advertisements	Steve Edsall/Trader	Indianapolis, IN
Clean Air BBS	(408)298-4277	Environmental Health/Cigarette Smoking Topics	American Lung Association/ Sheila Blash	San Jose, CA
Cleveland Fragnet	(216)368-3888	Cleveland City Information/Ohio Governor's Office Online	Case Western University/AT&T/Ohio Bell	Cleveland, OH
Computer Business Services	(714)396-0014	Computer Columnist John C. Dvorak's office BBS	John C. Dvorak and Nick Antis Jr.	Diamond Bar, CA
Computing Canada Online	(416)497-5263	Adjunct to Excellent Canadian PC Newspaper	Computing Canada Newspaper	Willowdale, Ontario
Dante Project BBS	(603)643-6310	Commentary/Research on Dante's Divina Comedia	Dartmouth College	Hanover, NH
Economic Bulletin Board	(202)566-4602	Economic Statistics/GNP/GPI/Labor Data	US Department of Commerce/Ken Rogers	Washington, D.C.
ELISA II	(202)697-3632	Export License Status Advisor - Technology Export Issues	Defense Technology Security Admin.	Washington, D.C.
Energy Info Admin E-Publications	(202)586-8658	Variety of Petroleum/Coal/Electricity Energy Statistics	US Department of Energy	Washington, D.C.
Event Horizons	(503)777-1578	Digitized Graphics Image Library	Jim Maxey	Portland, OR
EXEC-PC	(414)964-5160	Largest BBS in US - 90 Lines - 70,000 files - 4 Gigabytes	Bob Mahoney	Shorewood, WI
Family Radio Forum Headquarters	(415)562-5483	Center for Nationwide Network of Family/Christian BBS	Federal Communications Commission	Oakland, CA
FCC Public Access Link	(301)725-1072	General Authorization Status Advisory Service	R. Campbell and L. Rudolph	Columbia, MD
Federal Deposit Insurance Corp.	(202)737-7264	General Microcomputer Information	US Office of Personnel Management	Washington, D.C.
Federal Job Information Center	(313)226-4423	Federal Job Opportunity Lists available online	Federal Library Information Network	Detroit, MI
FEDLINK ALIX	(202)287-9656	Info on Federal Libraries-Excerpts Library of Congress News	John Friel III	Washington, D.C.
Forbin Project, The	(319)233-6157	Home of QModem SST Communications Software	US General Accounting Office/Sheryl Lee	Cedar Falls, IA
GAO Bulletin Board	(202)275-1050	Lotus/dBase/Word Perfect User Tips	US Geological Survey	Boulder, CO
Global Seismology Online Service	(303)279-6374	Earthquake Epicenter Data - Geomagnetism NEIS/QED	Dick Dillman/Greenpeace	Houston, TX
Greenpeace Environet	(415)861-6503	Ecological and Peace Issues - Disarmament/Toxics/Wildlife	Paul Meiners/P&M Software	Norcross, GA
GT PowerComm BBS	(713)772-2090	Home of GT Power Communications Software	Hayes Microcomputer Products	Atlanta, GA
Hay Locator	(317)494-6643	Database of Hay/Straw Suppliers and Buyers	IBM National Computer Center	Hamilton, Ontario
Hayes Advanced Systems Support	(800)US-HAYES	Eight Line Hayes Modem Support BBS	Eric Feistmantl	Washington, D.C.
IBM Users Group Support BBS	(404)988-2790	IBM PC User Groups Database - Newsletter Exchange	General Services Administration	Hillsborough, OR
Info-Source Canada	(416)574-1313	Online publications	Internal Revenue Service - Boise Office	Boise, ID
Information Resources Services	(202)535-7661	Fed Micro Procurement Rpts. - List of Banned Contractors	US Dept. of Navy / Chris Buechler	Arlington, VA
Intel Support BBS	(503)645-6275	Support for Intel PC Products - Inboard 386/AboveBoard 286	Alpha Systems Inc./Bill Griffin	Roswell, GA
IRS Tax Practitioner BBS	(208)334-1763	Income Tax Information - Questions Answered in 48 Hours	University of Minnesota	Twin Cities, MN
JAG-NET	(202)325-0748	Navy Judge Advocate General's Information Network	Curtis Abue/MCI Telecommunications Inc.	...
JOBBBS	(404)992-8937	Online Job Listings - 2186 Technical Pos. - 10,000 Corps.	Mike Stroud	...
LUMINA	(612)626-2206	Libraries of Univ. of Minnesota Integrated Net Access 7E1VT100	Micromim Corporation	Raleigh, NC
MCI Consultants Support BBS	(800)873-5548	Long Distance Rates/Technical Advice for Comm Consultants	Naval Aviation News/Cmdr. John Norton	Washington, D.C.
Micro Message Service	(919)779-6674	USA Today/Newsbytes/Boxoffice Magazines - 400+MB Download
Micromim Technical Support BBS	(206)881-8119	Support for Popular R:Base Relational Data Base System
NANCI BBS	(202)475-1973	Online Version of Naval Aviation News Magazine

NARDAC BBS	(804)445-1627	Zenith Computer Support - List of Federal Micro User Groups	Navy Regional Data Automation Center	NAS Norfolk	VA
NASA SpaceLink	(205)895-0028	NASA Educational Affairs Div. - Flight Data/Space History	Marshall Space Flight Center	Huntsville	AL
National Agricultural Library	(301)344-8510	Agricultural Info/Research Resources	US Department of Agriculture	Beltsville	MD
National E-Mail Registry	(800)622-0505	Register Your E-Mail Addresses Online - No Charge	National E-Mail Registry	Treasure	PA
National Genealogical BBS	(703)528-2612	Family History - Genealogical Research - Gravestone Haunting	National Genealogical Society	Arlington	VA
National Inst. Science Technology	(301)948-5717	Micro Elect. Info Exchange - Virus Protection/Security Issues	National Inst. of Science and Technology	Gaithersburg	MD
National Publishers Exchange	(813)989-1087	Headquarters for NPE Newsletter - Desktop Publishing	Ed Aborn	Tampa	FL
NAVWESA	(202)433-6639	Naval Weapons Engineering Support	Dept. of Navy / Bill Walsh	Washington, D.C.	
New York Macintosh Users' Group	(212)932-9513	Macintosh Downloads - MAC Street Journal Newsletter	Darryl Peck/New York Mac Users' Group	New York	NY
NIST ACTS	(303)494-4775	Automated Computer Telephone Service - Sync PC to NBS Time	Nat. Institute for Standards/Technology	Boulder	CO
NOAA	(303)497-5000	Solar Flare/Geomagnetic Data Online	National Oceanographic/Atmospheric Admin	Boulder	CO
NOAA Information Technology Exch	(301)770-0069	Microcomputer Applications and Recommendations	National Oceanographic/Atmospheric Admin	Boulder	CO
North Dakota State University	(701)237-8661	University BBS - Enter Class 20	University of North Dakota/Pete Lambert	Fargo	ND
Northrop Career Access	(213)938-5532	Northrop Aerospace Employment Opportunities - 7N2	Northrop Corp B2 Division	Pico Rivera	CA
NYCENET BBS	(212)769-0550	New York City Education Network	New York City Board of Education	New York City	
OERWIM Infolink	(202)586-9359	Radioactive Waste Disposal/Hazardous Materials Handling	Office of Civilian Radiation/Waste Mgmt.	Washington, D.C.	
Online Store DLX	(800)222-4922	Educational Statistics and Data - Performance Stats -	US Department of Education	Washington, D.C.	
PHYSICS Forum BBS	(805)656-0379	Online Catalog of PC Hardware/Peripherals - Online Mailorder	Stan Snyder/Online Store	Ventura	CA
PKWare BBS	(414)352-7176	Physics and Astronomical Sciences	Univ. of Mass. Dept. of Physics/Astronomy	Amherst	MA
Popular Mechanics Online BBS	(212)582-8369	Home of PKARC and PKZIP File Compression Utilities	Phil Katz/PKWare Incorporated	Glendale	WI
ProComm Support BBS	(314)474-8477	Home of ProComm 2.4.2 and ProComm Plus Comm Prgrms	Popular Mechanics Magazine	New York	NY
Publishers Information Svcs.	(312)342-6919	Xerox Ventura Publisher Support/Laser Printing/Scanning	Thomas Smith/DataStorm Technologies Inc.	Columbia	MO
Rocky Mountain High	(719)632-2658	Political Discussions - Unix UUCP Public Access - Multiline	George Weiners	Chicago	IL
SALEMDUG BBS	(202)646-2887	Hazardous Materials/National Dam Watch/Emergency Info	Dave Hughes	Colorado Springs	
Science Network	(213)372-2282	USA Today - BoxOffice Magazine - Local Real Estate	Federal Emergency Management Agency	Washington, D.C.	
Scenix Resource Studies BBS	(202)634-1764	Federal R&D Budget - Technical Labor Market Statistics	Connie Trantham/Sieve Campbell	Manhattan Beach	
SEABoard!	(201)473-1991	Support system for ARC, SEADOG, and AXE software.	National Science Foundation	Washington, D.C.	
Second Ring, The	(203)268-5315	Home of RBBS Software	System Enhancement Associates	Wayne	NJ
Silicon Valley Information Ctr.	(408)277-5758	Online Computer Magazine Index - Logon PUBLIC	Tom Mack	Trumbull	CT
Society for Technical Comm. BBS	(202)393-3557	STC Job Service, Freelance Registry - Technical Writers	San Jose Public Library	San Jose	CA
Synergy	(617)769-5468	Turbo Basic/Turbo C/Quick C/Turbo Pascal/Assembly Language	Society for Technical Communication	Washington, D.C.	
Take 3 BBS	(602)482-1001	Reviews of Movies/Videos/ Film Industry Job Clearinghouse	Gerry Powers/Jim Boxmeyer	Norwood	MA
TAXAOCM	(716)896-7581	Botany, Herbaria, FLORA ONLINE Newsletter, Latin Translation	Dave Kidder	Scottsdale	AZ
TBBS Net 104/23	(303)699-9248	Home of The Broad Board System (TBBS) BBS Software	Clinton Herbarium, Buffalo Museum	Buffalo	NY
Telecommunications Relay Station	(501)442-8777	Online Publications - Excellent TBBS System	Phil Becker/Soft Inc.	Aurora	CO
Telepodzilla	(503)621-3746	Home of ZModem File Transfer Protocol/YModem/YAM	Gary Funk	Fayetteville	AR
Telix Support BBS	(416)284-0682	Support Service for Telix Communications Software	Chuck Forsberg/Omen Technology Incorp.	Portland	OR
Texas State Law Library BBS	(512)463-1371	Online Legal Periodicals and Citation Database	Colin Sampaleanu/Exis Incorporated	West Hill	Ontario
The Well	(415)332-6106	Very Popular Big BBS - Hourly Charges	Whole Earth Lctronic Link	San Antonio	TX
Thomas Business Systems	(407)395-7057	Used Computer/Peripheral Price List Online Database	Phil Thomas/Thomas Business Systems	Sausalito	CA
TOPS Support BBS	(415)769-8874	Application Notes, Product Descriptions for TOPS LAN	Sun Microsystems	Boca Raton	FL
United Nations BBS	(201)795-0733	UN Press Releases - Unifex News - Unifex	Dr. James Waldron	Alameda	CA
US Naval Observatory BBS	(202)653-1079	Time - Date - Sunrise - Sunset - Enter @TCO for Commands	US Robotics Corporation	Hoboken	NJ
US Robotics - Sit UBU Sit	(312)982-5092	Support for US Robotics HST 9600 bps Modems	US Department of Commerce US Naval Obs	Washington, D.C.	
USA Today Distribution Service	(303)973-4222	Distribution Service for USA Today/Newsbytes/Boxoffice	US Robotics Corporation	Skokie	IL
USNO Time of Day for Clocks	(202)653-0351	Xmits ASCII Time String - Sync Your PC to USNO Atomic Clock	Denver PC Boardwatch Newsletter	Littleton	CO
UT Library Online Catalog	(512)471-9420	Online Library Card Catalog Listing 3.5 million entries	US Dept. of Commerce US Naval Obs.	Washington, D.C.	
VA Property Listing BBS	(602)241-2371	List of VA held property foreclosures	University of Texas at Austin	Austin	TX
Vacation Florida Database	(407)839-0333	Florida Tourism Information/Database of Campsites/Hotels	Veterans Admin - Phoenix Regional Office	Phoenix	AZ
Ward and Randy's CBBS	(312)545-8086	World's First and Oldest Micro-based BBS - Since 2/16/78	Richard and Barbara Kenney	Orlando	FL
WeatherBank	(800)827-2727	Online Weather Forecasts for Any City - Download Radar Data	Ward Christensen/Randy Suess	Chicago	IL
WeatherStar Pilot Briefing	(612)296-5426	Pilot Data, Weather, Great Circle Route, Airport Information	Steve Root/WeatherBrief Data Services	Salt Lake City	
Western Digital Tech Support	(714)756-8176	Hard Drive/Controller Installation and Config Data	Hayes Environmental Systems	Minneapolis	MN
XyQuest Support BBS	(508)667-5669	Support for XyWrite Word Processor - Custom Keyboard Files	Western Digital Corporation		
			XyQuest Inc. - Christine Madsen	Bellerica	MA

DENVER PC BOARDWATCH

LIST OF AREA CODE 303 ELECTRONIC BULLETIN BOARD SYSTEMS AND ON-LINE INFORMATION SERVICES - AUGUST 1989

TITLE	PHONE	DESCRIPTION	TYPE	BPS	SOFT	CITY	SYSOP
NBS Automated Computer Time	494-4775	ACTS - Sync PC Clock to NBS Atomic Clock	Custom	1200	Custom	Boulder	Natl. Bureau of Standards
Adelante 104/93	443-8292	Central/Latin America News/Issues	IBM	2400	Opus	Boulder	Zhaihai Stewart
Adventures Unlimited 104/616	1-223-4534	Online Games - Chess - Traders - More	IBM	2400	QuickBBS	Fort Collins	Ray Randolph
AmNet On-line 104/65	1-223-1297	Animal Rights Issues/Animal Rights Echo	IBM	2400	TBBS	Ft. Collins	James Cherry
Arkham Public Library 104/48	494-7970	Children's Games	IBM	2400	Opus	Boulder	Neil Beatty
Boulder Public Library Users Group	494-4470	Amiga Support - Over 1000 Amiga Files	IBM	2400	QuickBBS	Boulder	Ken Fricklas
Byte Shop 104/311	794-5065	Jokes/Good Echowall/Downloads	IBM	96HST	QuickBBS	Littleton	Dan O'Neal
CAL Denver 104/425	759-0410	Computer Access Support BBS	IBM	96HST	QuickBBS	Denver	John Denny
CBA Information System	329-0159	Continental Basketball Association	IBM	1200	TBBS	Denver	???
CEC Services	393-6715	ANSI True Basic Support Tools	IBM	1200	QuickBBS	Denver	???
Champaign Alley	220-5708	Financial Info - Free Exchange of Info	IBM	2400	RBBS	Denver	Patrick Hinde
Chatfield Armory	972-9023	Firearms for Sale/Trade - Online Games	IBM	2400	QuickBBS	Littleton	Dave Bell
Chidvilas 104/207	449-7399	Bhagwan Shree Rajneesh followers	IBM	96PEP	Opus	Louisville	Terry Mooster
Classifieds Plus/Consumers	794-0491	Consumer Interests/For Sale Items	IBM	1200	RBBS	Littleton	Arnold Peterson
Club Micro 104/88	973-5478	"C" Language/Database/Communication Files	IBM	96HST	Opus	Denver	Don Marquart
CMOS-CO Mtn Operating Systems	322-4078	Amiga/IBM-Utilities-Pictures-Buy/Sell	IBM	96MICROC	QuickBBS	Denver	Kevin Trullit
CO State Judicial BBS 104/420	831-1704	Colorado State Judicial ADP Department	IBM	2400	QuickBBS	Denver	Scott V. Hopta
Colorado Broadcasters 104/42	572-6256	Commercial Radio Frequency Lists	IBM	1200	Opus	Denver	Jeff Brothers
Colorado West BBS	1-241-1966	Grand Junction MUG - Ham/Packet Radio	IBM	96Hayes	PCBoard	Grand Junction	Wayne Hunt
Comm-Post, The 104/666	534-4646	Astronomy - 120+ MB of Files - Multiline	IBM	96HSTV32	TBBS	Denver	Brian Barte
Computer Consulting 104/318	973-1002	dBase Database Software Development	IBM	96Hayes	QuickBBS	Littleton	Jim Bucks
Computer Linkage 104/444	499-1022	Amiga/Atari/IBM/MTI - Medical Information	IBM	2400	Opus	Boulder	Ron Kusieski
Computer Repeats Inc.	939-8174	Used Atari/Amiga Equipment Sales	IBM	2400	PCBoard	Boulder	Don Whitaker
Control Systems 104/417	458-6248	IBM/Compatibles Subscription Board	IBM	96MICROC	RBBS	Denver	Lupe Raminiz
Cook, The 104/419	861-0814	Recipes/Cooking Theme 9P-7A	IBM	2400	QuickBBS	Denver	Richard Harper
Corrier Pub, The 104/414	759-8619	32 Message Areas \$10 fee - Amiga Support	IBM	2400	WWIV BBS	Denver	Richard Douglas
CP/M SIG INC 104/372	465-1313	Oldest User's Group in Area - CP/M - IBM	IBM	2400	Fido	Broomfield	Al Lundquist
Cyber-Zone, The 104/61	429-2208	Science Fiction/USA Today	IBM	2400	QuickBBS	Denver	Jonathan Wood
D-Link 1 104/411	936-2791	Golden Micro Computer Sales/Support	IBM	96HST	QuickBBS	Denver	Bob Wells
Dark Crystal, The 104/421	654-1278	Role Playing Games	IBM	2400	QuickBBS	Denver	Steve Boyd
Data Bank	494-0167	IBM Messages	IBM	2400	TCCOMM	Denver	Guido Binetti
Denver Link-Up	1-976-8800	\$0.25 per minute Source Code Downloads	IBM	2400	OPUS	Evergreen	Jeffrey Delude
Denver PC Boardwatch 104/555	973-4222	Back Issue Index, Dialing Directories	IBM	2400	TBBS	Littleton	Jack Rickard
Dinosaur Board 104/114	1-652-3595	THS80 Support/16 Online Adventure Games	IBM	96HSTV32	TBBS	Niwot	Chris Anderson
Dinosaur Egg	680-5985	Graphics Interests	IBM	2400	QuickBBS	Denver	Mick Clark
Eagle's Nest 104/315	933-0701	Contributions to Dumb Friends League	IBM	2400	QuickBBS	Littleton	Ronald Olsen
Education 2000 104/29	449-9807	Education Issues Kindergarten - 12th	IBM	2400	TBBS	Boulder	Roger Salamen
Emerald City BBS 104/214	427-1471	Electronics Discount World	IBM	2400	QuickBBS	Westminster	Daniel Osborn
Equinet	369-0738	Equestrian/Horse Interests	IBM	2400	TBBS	Aurora	Frank Maestas
eSoft Support	699-8222	TBBS Software Support - Hayes/USR Modems	IBM	96HST	TBBS	Aurora	Phil Becker
Estes Park High BBS 104/705	1-586-4131	School Bulletin Board System	IBM	1200	Opus	Estes Park	Joe Lundstrom
Flightstar Information Service	790-4356	Used Aircraft For Sale Database/Bluebook	IBM	2400	Custom	Englewood	Mickey Russell
Foxx Empire 104/617	1-484-4359	Online Simulation of Medieval Town	IBM	2400	QuickBBS	Fort Collins	Andrew Boardman
Fred's BBS	233-1316	Online Chess - Adult Areas	IBM	2400	QuickBBS	Lakewood	Fred Schupner
Free Information Exch. 104/89	699-1516	Programming - Home and Garden	IBM	2400	Opus	Denver	Charles Frnka
Free Thought BBS 104/423	860-9259	Objectivism/Libertarian Views	IBM	96HSTV32	Opus	Denver	Bill Williams
Front Range Online Sys 104/213	466-2296	Home of OKNEWS	IBM	2400	QuickBBS	Broomfield	Gary Jones
Front Range PC Users Group BBS	1-493-4094	Fort Collins Group - Computer Express	IBM	2400	Wildcat	Fort Collins	Tom Oppenheimer
FutureWave BBS 104/57	440-7425	Games / C Language / MIDI 6PM-7AM	IBM	2400	Opus	Boulder	Mike Reetz

Galaxy Express 999 104/215	469-3221	Japanese Cartoon Animation-Online Games	IBM	2400	QuickBBS	Broomfield	Bruce Arnold
Gay Community Fido 104/19	795-1215	Messages / Downloads for Homosexuals	IBM	1200	QuickBBS	Littleton	Withheld by Request
GDF: Technologies BBS	673-9470	Outstanding IBM Shareware/Programming	IBM	2400	Wildcat	Lafayette	Tom Gettys
Grotto, The	694-9050	Amiga, Pascal - Ebert Personal Computers	IBM	2400	TBBS	Aurora	Vincent Veritas
HP Haven 104/312	671-5976	Tradewares/On-line Games/ 5PM-7:30 AM	IBM	2400	QuickBBS	Westminster	Mark Willecke
In To The Night 104/31	659-1897	IBM Game Files 9PM-7AM	IBM	1200	Opus	Fort Lupton	Kris White
Intermittent Connection 104/60	797-0296	General Messages/Download	IBM	96HST	QuickBBS	Littleton	Jim Vorheis
Into The Wind 104/63	443-9073	Support for Shamaal Software 10P-11A	IBM	2400	Opus	Boulder	Dana P'Simer
JEFFCOM BBS	273-6951	Jefferson County Public Schools	IBM	1200	RBBS	Golden	Ron Dries
KDKO Radio 104/64	293-8462	Broadcasting Theme	IBM	2400	TBBS	Littleton	John Anderson
King's Market Bookshop 104/115	665-6091	Books, Writers, On-line Adventure Games	IBM	2400	TBBS	Boulder	Jim Burt
Lakewood Department of Safety	987-7388	Police Sponsored - Law Enforcement Msgs	IBM	1200	RBBS	Wheatridge	Larry Scheideman
Lensman, The	979-8953	Science Fiction/Fantasy Fandom News/info	IBM	2400	GT Power	Littleton	Greg Bradt
Lodge, The 104/212	420-0305	Arvada Quick BBS Board	IBM	2400	QuickBBS	Arvada	Harold "Monty" Montrose
M&D's Travelling Circuits	665-3746	Conversation - Techie Topics - Cooking	IBM	2400	CC-BBS	Louisville	Marshall & DeDe Barry
MACE 104/416	797-8090	Metro Area Computer Enthusiasts	IBM	1200	QuickBBS	Denver	Ken Zen
Manville Info Services 104/978	978-3946	Business Software / Apple Macintosh	IBM	1200	Fido	Littleton	???
MASC Library	497-5848	PC SIG CD ROM Online 4:30PM-7AM Only	IBM	2400	RBBS	Boulder	US Department of Commerce
Master Work, The 104/55	341-6614	In Search of the Lost Chord	IBM	2400	Opus	Aurora	Roy Prickett
Metamorphosis	1-772-7229	Small Minihost System	IBM	2400	Minihost	Lafayette	Tony Ferris
Microlink B 104/108	972-9600	1 Gigabyte Files - USA Today - Multiline	IBM	96HST	TBBS	Littleton	Girard Westenberg
Microlink D 104/711	237-8575	Over 200 MB - Doesn't Break	IBM	96HST	TBBS	Lakewood	???
Microlink Minus Two 104/204	369-5734	Professional Comp. Sales Inc./Astronomy	IBM	2400	TBBS	Denver	Paul Smith
Midrash 104/18	289-6864	Messianic Judaism - Religious/Philosophy	IBM	2400	QuickBBS	Denver	Daniel Segard
Mile High BBS	733-1340	Triathalons - Race Schedules - Fitness	IBM	2400	RBBS	Denver	Bill Ankele
Mile High Net	671-7308	Fido Board	IBM	2400	Fido	Aurora	Dave Miller
Mohave Net Gateway 104/62	426-0623	Science Fiction/Medical Echo	IBM	96HST	QuickBBS	Denver	Claude Warren
NetComm BBS	790-9349	Weather - Online Games - 110 MB	IBM	1200	GT Power	Littleton	Bill Watts
New Age Bulletin Board, The	366-1106	Health, Ecology, Philosophy	IBM	2400	TBBS	Aurora	Hal/Fran Piser
NightFlyer 104/210	467-9199	Basic/dBase/Assembler/C Programming	IBM	2400	QuickBBS	Arvada	Marcel Madonna
Nurse Link 104/52	270-4936	UCHSC School of Nursing	IBM	2400	TBBS	Littleton	Larry McNeill
OKY BBS 104/113	494-0533	Armenian Electronics Consultant	IBM	2400	QuickBBS	Boulder	Ornig Kouyoumdjian
On-Line Consulting 104/45	449-5251	Consultant Directory/Desktop Publishing	IBM	2400	Opus	Estes Park	Lee Lasson
On-Line Shopping Service	442-5125	Boulder Home Grocery Delivery \$5 + 5%	IBM	1200	Chairman	Boulder	Pete Dempsey
P2B2 S 104/51	329-3337	Public Psychiatry / AI Themes 6PM-8AM	IBM	2400	QuickBBS	Denver	Claude Warren
Paranet Omega 104/422	431-1343	Paranormal/Religion/UFO/Oddities	IBM	96HST	QuickBBS	Wheatridge	Mark Owens/Mike Corbin
PCIS 104/804	789-4610	PC Info Services - List of User Groups	IBM	2400	Opus	Englewood	Phil Kaiser
Pentax Support	460-1637	CD WORM/Flatbed Scanner/Fanfold Laser	IBM	1200	TBBS	Broomfield	Chris Anderson
Phoenix TBBS 104/739	841-9570	Multiline - INFOMAT - Chat areas	IBM	96HST	TBBS	Parker	Larry Kayser
Pinedlife 104/28	444-7073	170 Meg - Online Order for CDB Systems	IBM	2400	Opus	Boulder	Craig Baker
Pink Flamingo 104/607	497-3934	Previously Fido NBS	IBM	96HST	QuickBBS	Boulder	Cathy Nicolletti
Priority Business Sys. 104/41	771-8107	PC Magazine/Tech Journal Files	IBM	2400	Opus	Littleton	John Bilbro
Professional System, The	740-2223	Writers, Lawyers, EDP Auditors	IBM	1200	TBBS	Littleton	Bob Voorhees
Quest, The	429-4617	Online Chess/Tradewares/Empire/Tnvia	IBM	2400	QuickBBS	Denver	???
Quick BBS Support Board 104/24	423-3114	Home of Quick BBS Software	IBM	2400	QuickBBS	Arvada	Adam Hudson
R.A.E.I.T.	757-9509	Colorado Highway Department - Planning	IBM	1200	TBBS	Denver	Colorado Dept. Highways
Reading Room, The 104/513	690-5410	6PM - 6AM Ringback System during day	IBM	2400	RBBS	Aurora	Don Bell
Ready Room, The 104/424	329-8136	USS Tatalak NCC-1799-B	IBM	2400	QuickBBS	Denver	Jason Steck
Realtime Control & Forth Board	278-0364	Vesta Technology/Denver Forth Int. Group	IBM	2400	PCBoard	Wheatridge	Jack Woehr
Regency Datasource 104/58	972-1222	Private Computer Consulting Support	IBM	96Hayes	Opus	Littleton	Charlie Bass
RiBBS Support Hdqtrs. 104/54	343-6707	Support for CoCo RiBBS Software	IBM	2400	QuickBBS	Aurora	Ron Blier
Rocky Mountain RBBS	750-2107	INFO NEEDED	IBM	1200	RBBS	Aurora	Steve Komreich
Short Line 104/36	778-7312	Vaied Topics, Fidonet, BinkleyTerm	IBM	2400	Opus	Lakewood	Alan Applegate
SnarfQuest V 104/317	973-0625	The Tower	IBM	2400	QuickBBS	Littleton	Radford Walker

DENVER PC BOARDWATCH

LIST OF AREA CODE 303 ELECTRONIC BULLETIN BOARD SYSTEMS AND ON-LINE INFORMATION SERVICES - AUGUST 1989

TITLE	PHONE	DESCRIPTION	TYPE	BPS	SOFT	CITY	SYSP
SnarfQuest VI - The Mirage	933-2370	Online Games - 120 MB of Downloads	IBM	2400	Phoenix	Littleton	Jon McDonald
SnarfQuest III 104/209	469-0125	The TALL Snarf Messages-Games GCQ	IBM	96HSTV32	QuickBBS	Broomfield	Elliott Mosher
SnarfQuest II 104/46	761-1634	The Arena On-line Games, Fantasy, AD&D	IBM	96HST	QuickBBS	Englewood	Dax Davis
Sound Doctrine BBS 104/514	680-7209	Christian BBS / Sound Doctrine Church	IBM	2400	TBBS	Aurora	Tim Williams
Space Environment Service Cntr	497-5000	NOAA Solar Flare Forecast / Advisory	IBM	1200	PBBS	Boulder	US Dept of Commerce
Space Network	494-8446	Space Exploration Information	IBM	2400	TBBS	Boulder	Tom Meyer
Squirrel's Nest	1-242-7977	Grand Junction BBS	IBM	2400	PCBoard	Grand Junction	Allan Worley
Steamboat Information	1-879-6741	Info on Steamboat Springs Area	IBM	1200	TBBS	Steamboat Springs	???
Stone Wall 104/112	499-2676	Tradewars/ReadMAC Files	IBM	96HST	QuickBBS	Boulder	Mike Reetz
Summit TBBS 104/47	1-468-2749	Ski Information	IBM	96HST	TBBS	Dillon	Lawrence Kehi
TBBS Net 104/23	699-9248	The B'read B'oard System Support	IBM	2400	TBBS	Aurora	Phil Becker/leSoft Inc.
TelePeople 104/69	455-3283	Lifestyles - Singles - Divorced	IBM	2400	TBBS	Denver	Terry Travis
Terus Public BBS 104/43	469-7161	MINDS AI TextBase Indexer Support	IBM	96HST	Opus	Broomfield	Todd Hill
Terus RegUser 104/44	341-1404	MINDS Online Textbase - USA TODAY	IBM	96HST	Opus	Aurora	Bart Henthorn
The 8th Sea 104/510	252-9235	Fidonet 104 Net Coordinator	IBM	2400	QuickBBS	Northglenn	Rod Lamping
Translations Unlimited	988-5765	Language Translation 6PM-6AM	IBM	2400	Minihost	Lakewood	Ron Johnson
Twin Peaks PCBoard	1-651-0225	On-line Games	IBM	2400	PCBoard	Longmont	Ken Krueger
Value Line, The 104/510	366-1611	MultibBS System Opus/QuickBBS/RBBS	IBM	2400	QuickBBS	Aurora	Chris Millikin
Vet Set, The	690-3218	Veterans Issues - Colorado Lottery Data	IBM	2400	RyanBBS	Aurora	Alfred Petersen
Watchdesk, The 104/66	450-0822	Safety - Arson - Hazardous Material	IBM	96HST	QuickBBS	Thornton	Emit Hurdalbrink
Waterton RBBS	977-7353	Martin Marietta Employees Only	IBM	2400	RBBS	Denver	Ken Beaudre
Weyr, The 104/211	429-2975	Good Collection of Game Software	IBM	96HST	Opus	Westminster	Ken Shimko
Wizardry 104/630	670-1416	Fantastic Online Blackjack/Casino Games	IBM	96HST	QuickBBS	Evergreen	Marvin Cook
World Peace BBS 104/415	320-4822	Current Events, Politics, Religion	IBM	2400	QuickBBS	Denver	Bucky Carr
YUCCA Mountain Project Group	236-9812	US Bureau of Reclamation - Dept of Int.	IBM	12-19200	PCBoard	???	Mark Pabst
Land of the Lost	322-7562	Robot Hobbyist/AI/Electronic Repair	IBM	300	Fido 11W	???	STACK
C.A.R.L. Denver	830-0519	Colorado Alliance of Research Libraries	Tandem	2400	Custom	Denver	N/A
C.A.R.L. Denver	830-1165	Colorado Alliance of Research Libraries	Tandem	2400	Custom	Denver	N/A
C.A.R.L. Denver	830-1546	Colorado Alliance of Research Libraries	Tandem	1200	Custom	Denver	N/A
C.A.R.L. Denver	830-1547	Colorado Alliance of Research Libraries	Tandem	1200	Custom	Denver	N/A
C.A.R.L. Denver	830-1548	Colorado Alliance of Research Libraries	Tandem	1200	Custom	Denver	N/A
C.A.R.L. Denver	830-2199	Colorado Alliance of Research Libraries	Tandem	2400	Custom	Denver	N/A
C.A.R.L. Denver	830-2241	Colorado Alliance of Research Libraries	Tandem	2400	Custom	Denver	N/A
C.A.R.L. Denver	830-2265	Colorado Alliance of Research Libraries	Tandem	2400	Custom	Denver	N/A
C.A.R.L. Denver	830-2297	Colorado Alliance of Research Libraries	Tandem	2400	Custom	Denver	N/A
C.D. Players	825-0419	Computer Discount On-line Store/Amiga	Amiga	2400	TBBS	Denver	Jay Tompkins
Arvada 68K BBS	469-9862	Amiga/Macintosh/Atari ST/Motorola 68000	Amiga1000	2400	BBS-PC	Denver	Reid Bishop
Greenline	650-1509	Amiga Messages and Downloads	Amiga1000	2400	BBS-PC	Broomfield	Phil Green
Ninth Portal, The	690-5001	SciFi/Fantasy Starship Exploration Game	Amiga2000	2400	Atreides	???	Rick Henderson
Outer Limits BBS, The	1-484-1699	Amiga System Emulating IBM-XT	Amiga2000	2400	QuickBBS	Fort Collins	Gary Whicker
Aces High	366-8159	Apple Programming/Messages	Apple	2400	GBBS	Aurora	Jeff & Steve Brothers
APSNet	693-6737	Aurora Public Schools Network	Apple	2400	GBBS	Aurora	Columbia Middle School
Box's Cabin, The	424-9185	Apple / Technical Notes	Apple	2400	Protree	Arvada	Kent Roberts
C.A.C.H.E.	745-4960	CO Apple & Compatible Home Enthusiasts	Apple	2400	GBBS	Denver	Gary Edwards
City Morgue, The	442-8498	Necromaniacal Fixation With Stiff Bodies	Apple	2400	GBBS	Boulder	???
Denver Deaf-Net	989-9245	Hearing Impaired/Computing	Apple	1200	Protree	Lakewood	David Sheneman
Enterprise	377-1005	Local Radio Freq List - Star Trek Theme	Apple	2400	Protree	Denver	Jeff Tensly
Funny Farm	989-0915	Apple Only BBS	Apple	2400	???	Lakewood	???
Genesis Project	287-8267	Apple II General	Apple	2400	Protree	Commerce City	Gene Humbert

Greeley-Com-Net 1-351-8861
L&L Support 420-3568
Laboratory BBS/SUPERTAC 287-5274
Land of London 987-2094
LES-COM-net 526-2046
Mom's BBS 690-4913
Bavarian's Gausthaus 367-5877
Four Wheeling BBS, The 469-4954
Generic BBS 1-857-6881
Hozenville 985-9760
Mile High Forum #5 431-1404
Mycroft 777-8898
Ron and Shannons BBS 978-0298
Skyline Computers 457-0320
Cricket's Hollow 499-9828
Phasar 745-4305
Regimental Headquarters 375-9556
Acme Detective Agency 933-2377
Albuquerque Starport 279-4655
Gridiron, The 797-6003
Mailbox BBS 421-8050
Phone Connection 426-7969
Pit Stop, The 364-3927
Pyroland 745-5213
Realm, The 937-0215
Seven-Eleven 699-7603
Vern's Terminal Exchange 433-1150
Computer Know How 279-0224
Fantasy Mountain PBBS 278-8369
KCNC Storm Center 4 Weather 839-1188
Mile High Epson User Group BBS 752-2943
HP-BBS 104/34 1-229-9719
LaserWriting Desktop Service 741-4122
Mile High Mac Meet 758-9159
MLM International Networks 933-2654
Publishing Resources Inc. 442-2011
Radscon 1-675-3225
Radscon 1-675-3326
Boulder Public Library System 444-2057
Boulder Public Library System 444-2074
Kings Bench 104/615 377-6725
College Board, The 979-7299
Mountain Man TI 797-6783
Nitelina PBBS 277-1447
Controller Board/TBBS Island 690-9423
Crossroads 499-0457
Photo Tech 781-1079
PSINet 985-2634
Terra Main 830-8098
Alpha BBS/intercomex 367-1935
Temple of Doom 771-9523
GLOBAL Information 286-7914
USGS Quick Epicenter Determ. 279-6374

Modem Users Board Apple 2400
Primary GBBS Pro Software Support BBS Apple 2400
Commodore with Laboratory Theme Apple 96HST
Fantasy Runequest Games Apple 1200
Lesley College Comm Net - GBBS Multiline Apple 2400
General Messages/Socializing Apple 2400
New Atari BBS Software System Atari 1200
Jeeping / Camping / Outdoors Atari 2400
Titanic Historical Society Information Atari 1200
Atari 130 with 53 MB of files Atari 2400
Outstanding Atari ST Database - HST 9600 Atari 96HST
Horizon Computer/National Atari BBS List Atari 1200
Atari Support 5.4 MB XE 130 Atari 2400
Atari ST Support, Files, etc. Atari 2400
Commodore BBS C-128 1200
Teen Conversation - Advice Column C-128 1200
Commodore - Military Theme C-128 1200
Profanity Allowed C-64 1200
Commodore Network Systems International C-64 1200
Football Theme C-64 1200
Ham Radio/Sports/Swap/Adult Jokes C-64 300
Commodore 64 BBSing C-64 1200
Auto Racing Theme C-64 1200
Pyromania - Burning Things C-64 300
Royal Theme - Complete with King C-64 1200
Commodore 64 system C-64 1200
Commodore Messages/Downloads/Ads C-64 1200
Hard Disk Installation / Tech Support CP/M 1200
Deaf and Handicapped Issues ASCII TTY CP/M 2400
National Weather Service Digital Radar DEC VAX 1200
MHEUG Club Board EPSON 2400
Jokes, Amazing but True stories HP-Vectra 1200
Laser Printing/Scanning/Linotronic 300 MAC 1200
Denver Macintosh Users Group MAC 96HST
Online Mail - TANDY Computers - MCI Tel. MAC 1200
Laser Printing/Publishing/Linotronic MAC 1200
Rangely PDP11 BBS Multiline - Games PDP-11/45 1200
Password RADSCAN - PDP-11/45 1200
Library Research Tandem 1200
On-Line Card Catalog - Member C.A.R.L. Tandem 1200
Compatible Computer Info Exchange TANDY1000 2400
Space Wars Game Tandy2000 300
Denver TI Users Group - Texas Instrument TI 2400
Texas Instruments - Lists 193 TI BBS TI 99/4A 2400
Computer Supplies - Online Sales TRS 1200
Discussion TRS 2400
TRS 80 / HAM / Video / Camera TRS 2400
Parapsychology / Near Death Experiences TRS 1200
TRS80 Model 4 Support-Messages-SdFI TRS80 4 1200
Enter ALPHA - Ham Radio/Space Topics Unix Mini 1200
INFO NEEDED unknown 1200
Fee Subscription / Software Database VAX 2400
Earthquake Data CLASS:NEIS USER:OED VAX 300 7E2

GBBS Greeley Lowell Shatraw
GBBS Arvada Lance Taylor-Warren
GBBS Denver Professor Beaker
Alphall Lakewood ???
GBBS Genesee George Willett
Protee ??? Margarite ???
Express Aurora Bavanian
STadel Broomfield John Ferguson
BBS Exp Fort Lupton L.A. Sneeringer
TODAMIS Denver Jacoy Squires
Forem Anvada ???
TODAMIS Denver Phil Michaelson
OASIS Englewood Ron/Shannon Sellers
Forem Denver Dave Lloyd
C-Net Aurora Cricket
C-Net Denver Bob Grear
Visions Golden Snake-Eyes
C-Net Golden Greystoke Mindmaster
ImageBBS Westminster Richard Miller
C-Net Westminster The Lineman
C-Net The Rascal
TelExcel Pyro Pete
C-Net Lakewood Bob Hennessy
NewImage Denver Hack Man
Ivory Denver ???
ZBYE Golden John Holmgren
PBBS Golden Steve Shockley
Custom Denver KCNC TV
TBBS Aurora Dale Bucknam
TBBS Fort Collins Rob Diehl
RedRyder Denver Bill Wright
WWIV Denver Jon Taylor
MouseEx Littleton Michael McKizzic
RedRyder Boulder ???
RSTS9.4 Rangely John Henderson
RSTS9.4 Rangely John Henderson
Custom Boulder Eyring Research Institute
Custom Boulder Eyring Research
Fido Denver Ralph Allison
??? Littleton Tom Nielson
Tiger Littleton Roy Bartee
Paradigm Golden Keith Amann
TBBS Aurora Mike Hastings
TBBS Lakewood Mark Bradford
TBBS Englewood Jim Gerritz
TBBS Denver William Tedder
Tandy Tr Denver Barry Hunsicker/Capt Kirk
UNAccess Denver Cyro Lord/Robert Brumley
??? Englewood ???
Custom Denver Jim Comstock
??? ??? Bruce Presgrave

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95

IN THIS ISSUE

Source Information Network Dies.....	1
Bill Suspends Constitutional Rights for Online Services	1
National 3 Gbps Supernet Bill in Congress	1
80386SX Upgrade for PC/XT Machines	3
Long Distance Carrier Identification Number ..	3
GEne Adds ZMODEM File Transfer	3
Macintosh Connectivity Options	3
AT&T Opens Direct-Dial Link to Moscow	4
Kermit Protocol Goes International	4
US Robotics Adds 3 Internal Models	5
ISDN Card for PC	5
FREE CD-ROM Magazine	6
IBM/AST Announce 486 Cards	6
Canon Invests \$100 Million in NeXT	6
Wireless Radio LAN	7
Solar Flare Information Online	7
PRODIGY Comes to Denver	9
Botanical/Herbarium Research BBS	12
Minnesota Library Online Card Catalog	13
UFO Information Service	13
Writers Happy Hour BBS	13
Public Brand Software BBS	14
What Price Justice - Statutes on Tape	14
Colorado Education Network Proposed	15

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